NEWS IN PERSPECTIVE

MAY 1, 1961

MANAGEMENT VIEW

SALES EXPENDITURE INCREASES are acceptable to top management whenever it is shown how the increase can work to improve percent return, EEI's Managing Director Edwin Vennard reminded conferees at the Institute's annual sales conference. He observed: "I believe we can increase our sales expenditure to the amount we were spending in 1937—about 2.5-cents per dollar of operating revenue—always provided we sell a balanced load at a proper price." (See p. 54.)

RESIDENTIAL SALES BUILDUP on the American Electric Power System, predicted by AEP's Pres. Sporn, will involve an annual volume of some 12-billion kwh in service to a half-million homes by 1975. This residential sales total "should approach very closely our 1960 sales to all customers, including our thousands of industrial customers," he adds.

NEW MONEY FINANCING in the electric and gas utility field was at the lowest point in over three years in March (though electric utility issues made up most of the activity); but, in April a definite pickup occurred.

SHAREHOLDERS "IN-THE-ROUND"—Last month Pennsylvania P. & L. Co. sought to encourage greater shareholders interest in the utility's affairs, gathered a record turnout for an annual meeting under a candy-striped canvas big-top. Most unique feature of the meticulously designed operation was the circular seating arrangement—with speaker's platform in the hub, revolving completely (and almost imperceptibly) every seven and one-half minutes . . . so that speakers never turned their backs permanently to any section of the audience.

SHAREOWNER RELATIONS PROGRAM of the Wisconsin P. & L. Co. hits another peak currently, with a two-month program of 15 general meetings to which all shareowners in the utility's operating territory are invited. Since about 65-percent of the Wisconsin utility's stockholders live in the state, the program goes a long way in "maintaining the close and working relationship (which is) part fulfillment of our responsibility to the people who have invested their money in the company," as Pres. Carl J. Forsberg recently expressed his corporate approach to the N. Y. Society of Security Analysts.

ADVANCE PLANNING, INTERCONNECTION—How investor-owned utilities look ahead is demonstrated with new force every day. Examples: Thus 350,000-volt transmission line linking 6.5-million kw on four systems in Texas (prompting Gulf States Utilities Co. Chairman Roy S. Nelson to comment: "It is no longer economically possible for individual companies to make long-range transmission plans without considering jointly the plans of other utility companies in the area"); the explanation to the public service commission by V. K. Smith, distribution planning engineer of Mississippi P. & L. Co. (in a case disputing franchise rights to expand service as a city limits expands) that it is necessary for his company to plan facilities 10 years in advance so that the utility will have electricity when customers need it; and New Jersey P. & L. Co.'s newly revealed project involving construction (in a remote and undeveloped tract) of a 300-megawatt pumped storage facility by the utility . . . and coordinated development by the state of New Jersey of adjacent areas for recreation and water supply.

WONDERS OF A "TAX-FREE" WORLD: The New York State Power Authority's Chairman Robert Moses explains how key power projects can go forward successfully (a) without tax money and (b) without tax burden. Recently he pointed out that the "largest hydro-electric project in the free world" (Niagara) is being constructed "without tax money or governmental credit of any kind;" and about the same time, in a memo to New York Gov. Rockefeller, he noted that his Authority could produce atomic power 25-percent cheaper than investor-owned utilities due to tax advantages.

SPREAD OF COMPETITIVE BIDDING to many more lines of equipment purchased by utility companies has taken place, with utilities cautious about records which may be subject to future scrutiny. And, most regulatory commissions have requested reports from utility companies relative to damages which may have been incurred in the past years covered by the recent anti-trust actions. In some utility companies, too, management has asked purchasing officials to recommend possible changes in marketing procedures . . . to avoid involvement in any future legal actions.

SUPPORT ECONOMIC EFFICIENCY in government water resource projects, J. K. Busby, president of Pennsylvania P. & L. Co. urges utility top management. Addressing the recent Southeastern Electric Exchange meeting, he proposed attacking Government multi-purpose projects where they are vulnerable: when they are "unsound and therefore a drag on national growth."

ECONOMIC CLIMATE

STRENGTH OF THE UPTURN in business is causing some concern. Though improvement is apparent in a number of significant sectors of the economy, it is difficult to tell the extent to which gains are seasonal and the extent to which they reflect fundamental improvements. At times, of course, this distinction makes little difference. It can be important, however, in assessing the validity of an apparent change in economic direction.

UPWARD MOVEMENT of several important economic indicators is encouraging. Steel production, new orders for durables, retail trade, industrial production, and key consumer goods are showing strength. On the other hand, relatively less buoyancy is visible in personal income and housing, despite government aid to homebuilding.

UNEMPLOYMENT will be a persistent problem, even if the coming advance in total production is more than modest.

WASHINGTON INFLUENCE

BUDGET CHANGES proposed to Congress by President Kennedy will have substantial impact on public power. He seeks another $100-million for REA to carry out its loan programs "at levels more nearly adequate to meet the increased demands for electricity in rural areas." Not all would be lent in fiscal 1962; a net increase of $15-million in expenditures seems indicated. An additional $2.3-million is sought for five Bonneville Power Administration transmission lines. This is only a start on construction; by 1964, total cost would have mounted to over $32.7-million. In addition, the Interior Department has reprogrammed funds on hand to speed activity on several Reclamation projects. Total involved in the coming fiscal year is over $286-million. Included is $300,000 for a network intertie study that would determine benefits that might accrue from high-voltage transmission line interconnections between existing, planned and potential river basin power systems. The President has also requested another $12-million to finance air and water pollution work, and an extra $22.4-million for Army Engineers construction projects.

PUMPED STORAGE is getting increased attention as part of the New Frontier. Assistant Interior Secretary Holum has called it "one of the exciting new concepts in electric power generation." He predicted that as electric loads grow, "substantial development" can be expected in new pumped storage plants. The Corps of Engineers has drawn attention to its "increasing significance" and has issued guidelines for evaluating pumped storage at Corps projects.

REA CO-OPS have been advised by the government of the basic data they need in deciding whether to file triple-damage suits against manufacturers of electrical equipment that violated the antitrust laws. The government tells each co-op it must determine "whether and to what extent damage has been sustained" in its equipment purchases. The suits "need not be limited to the company from which the purchases were made; all or any of the parties to the conspiracy may be made defendants." It adds that if co-ops decide to sue firms that pleaded "no contest" to the charges, their cause "would be aided by a tendency of the courts not to require precise proof concerning violation of the antitrust laws, where price-fixing by the defendant is shown."

Antitrust Chief Loevinger has said that, in addition to bringing damage suits against suppliers of price-rigged items (unless adequate money settlements can be negotiated), the Justice Department will cooperate with state governments and other public bodies in their damage suits. (One such body—the L. A. Dept. of Water & Power—last month revealed it made purchases totalling at least $19-million in the '51-'60 period, would rely on results of nationwide survey to determine extent of damages incurred.)

REA-FINANCED G&T will be encouraged, says Administrator Clapp, and REA will give "top priority" to power supply problems. Further, when co-ops' service areas are threatened, "we are going to be in the fight to help cooperatives maintain their territorial integrity." REA co-ops, in Clapp's view, should play an active role in the industrial development of rural areas. Their actiivties should "not be confined to the business of enticing ready-made industry" into their areas, but they should "assume leadership in forming local community development committees" and work with other co-ops in "taking an area-wide approach to mutual problems." The Rural Area Development Board, established by Agriculture Secretary Freeman, includes REA as one of the 11 member agencies.

ECAP CASE, still in the courts, has allowed investor-owned utilities to make a number of points concerning FPC's disallowance of certain advertising costs as a business expense. The court has been told this violates the companies' freedom of speech and deprives them of property rights without due process of law. They contend that the ads in question were directed against "electric systems—owned or subsidized by the government—which were business rivals." The utilities' moves, says ECAP, were "business practices—techniques used in the competitive process"—not "political in character" as FPC claims. ECAP also opposed the Commission's arrogating to itself the right to censor the companies' advertising.

RECLAMATION PROCUREMENT would help portions of aluminum conductor and steel overhead ground wire for transmission lines from firms in these areas. First set-aside is 60-percent of the conductor and ground wire for the Glen Canyon-Four Corners 230-kv transmission line. The same percentage of high voltage wire requirements for the line located on the Bureau's Central Valley Project will be set aside for depressed areas.

PREFERENCE CUSTOMER CONTRACT held by a private power company has been terminated by the Interior Department. Assistant Secretary Holum explained that construction of new switchyard facilities at Fort Peck will enable the government to deliver 33,500-kw of firm power to preference customers in the Missouri River Basin's Eastern Division. The short-term Reclamation power sales contract with Montana Power Co. was for 25,000-kw.

ADMINISTRATION BACKING for a national fuels study is assured, says Interior Secretary Udall. He noted, "We can not in something as important as fuels and energy let policy be set by drift or by default." A "long-range study, a balanced study" is in the interests of national security and the health of the economy.

CONVERSION AT HANFORD, Wash., to generate by-product power—endorsed by the Joint Committee of Congress as "economically beneficial" and approved by the Administration via a $60-million budget request, rests at least in part on a BPA study of the potential market for power in the NW.

BPA: AN ACTION AGENCY—This is the aim of administrator Charles F. Luce, who has endeavored to "revitalize" BPA's Pacific Northwest programs by setting up a new division of power management and re-grouping on a functional basis all operations relating to power marketing, resource planning and system operations. "Instead of a holding operation," BPA emphasis is now on the responsibility for planning resource development to match the region's power needs.

PLAN FOR DEVIL CANYON project, proposed by the Reclamation Bureau, has been sent to Alaska and interested federal agencies for review and comment. Commissioner Dominy found the Susitna River project economically feasible with a benefit-cost ratio of 1.72 to 1. Total cost is estimated at almost $499-million, all allocable to power and repayable by consumers. Plan calls for two major dams and reservoirs and a 580,000-kw powerplant with ultimate generating capacity of 2,755-million kwh of salable firm energy annually.

INDUSTRY SIFTINGS

UTILITY PURCHASING MEN must keep close watch on a market situation where equipment price changes occur frequently these days. Most changes have been downward (as much as 15-percent, on such General Electric items as voltage regurators, instrument transformers, apparatus bushings, gas turbine package powerplants); but, in other cases prices have moved up—examples: GE's lamp prices, increased 1-percent overall; Allis-Chalmers power transformers, now priced "at net values, under previously published levels but above today's market level;" Line Material's capacitor equipment (to $117.00 for a 50-kvar unit).

INDUSTRY-WIDE "CODE OF ETHICS," proposed by Mark W. Cresap, Jr., president of Westinghouse at the company's annual stockholders meeting, would set forth "unassailable standards in conduct and performance in the electrical industry" to safeguard the industry against further anti-trust violations. He stressed his conviction that the industry, "must rededicate itself to the pursuit of unquestionable standards of conduct."

BEST OUTDOOR POSTER used in 1960 in markets of 200,000 to 500,000 was displayed by Virginia Electric & Power Co., according to the Outdoor Adv. Assoc. of America. Winner in one of 12 divisions in which 370 entries competed, the VEPCO design was titled: "Bright Idea—Electric Gifts."

GE'S "LOAD" MAGAZINE, a welcome tool in the power sales field for years, has been discontinued, though the company intends to continue other means of furthering its cooperative relationship with utility customers in the field.

TRANSFER OF DEFERRED TAX RESERVES (arising from the use of Sect. 167 of the Int. Rev. Code of 1954) to the Depreciation Reserve has been ordered by the California PUC. Also, all companies continuing to use normalized taxes after March 21 are to credit the annual deferral to the Depreciation Reserve. In a dissent, two Commissioners said the order would have the effect of discouraging utilities to use liberalized depreciation . . . and cause utilities already using this method to use straight-line depreciation for tax purposes. The Order is expected to be tested in California courts.

NEW TVA STEAM PLANT SITE, on the Clinch River in Tennessee instead of in East Kentucky, says TVA, means a cost advantage of $30-million for the 900,000-kw unit, being built by G. E. A second 900,000-kw unit is planned to be added, and record-size boilers will be built for the TVA plant by Combustion Engineering, Inc.

LARGEST MICROWAVE SYSTEM known to be in utility service is Consumers Power Co., which recently leased it from RCA. Consumers Pres. James H. Campbell describes the network on the utiilty's far-flung system—1186 mobile units operated from 51 control points—as an "absolute necessity."

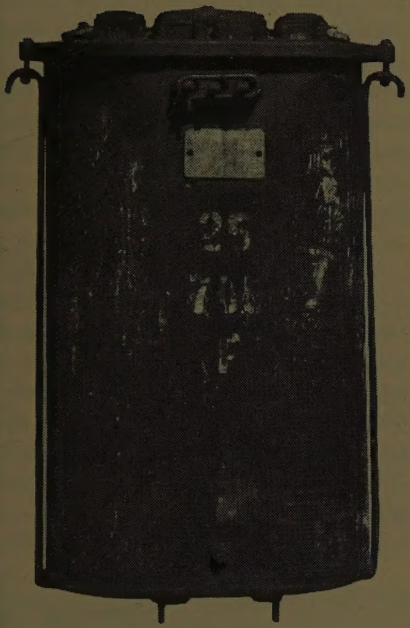
SAFEST YEAR IN AEC HISTORY—('60) was followed quickly by a string of accidents (including the SL-1 Reactor accident at the NRTS) that took the lives of six Commission employees. Observes AEC Gen. Mgr. A. R. Luedecke: Continued safety vigilance is needed. Meanwhile, the AEC found in its survey of operation and maintenance procedures at 131 Commission-owned or licensed reactors that a more comprehensive review and updating of safety procedures and measures is needed at certain facilities.

PLANT CONTROL COMPUTER for handling the startup and shutdown of a 200-megawatt boiler in a new UK power station located near London is being built by Ferranti (on order from Babcock & Wilcox)—the first computer in the world to carry out this type of plant control operation.

SALE OF DRY FLYASH by the Appalachian Power Co. is expected to improve the utility's disposal picture, "because dry flyash is superior to flyash in the wet state and offers the best potential growth market," the company notes. New equipment at the powerplants will collect the dry flyash for storage in silos, replacing present equipment that has used a water slurry to carry it to a disposal area.

1886

40°C RISE



25 KVA

1910

55°C RISE

25 KVA

1961

65°C RISE

25 KVA

Watch for the Westinghouse announcement on the new LL-65 distribution transformer soon

You can be sure . . . if it's
Westinghouse

J-70962

Municipal Systems Told: Keep PR Fences Mended

Municipal electric power systems, over the years, have neglected to explain to voters their long-range needs for plant expansion financing . . . and when they come up against the need abruptly, management must turn quickly to some means for "engineering public understanding."

This is the way one public relations man explains the market for his special talents—which have been impressively successful in a number of political assignments in recent years. Southern cities have given Don Morris, of Brownsville, Texas, opportunities to develop and apply short-range information campaigns aimed at facilitating the winning of elections and revenue bond issues.

But, here's the way Don Morris explains his functions:

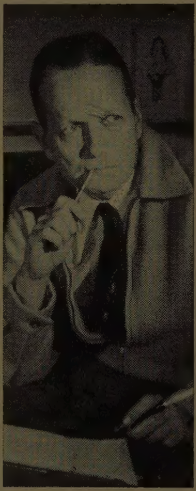
"My business, as an independent public relations man, is devoted to a considerable extent to providing short-range public information campaigns for municipal utilities which have run into public opinion troubles. My work in any campaign is only a fraction of the community effort, I should note.

"I help municipal power boards tell their public why a favorable vote is needed to increase generating capacity. I do this through public information campaigns, specifying that I have to believe in the merits of the proposition before I will attempt to sell it.

"In limiting this service to municipalities, I've nothing against private power companies. But private power companies, with their vast mobile staffs of public relations and advertising men and revolving vice-presidents, don't need me. They ought to be able with all their talent and money to do an overwhelming job of public information and if they seem to me to be missing the target pretty often, so much the better for me.

"The municipal systems, like any other, always come up against the need for more generating capacity sooner or later in a growing community. Despite the fact that they will finance this by revenue bonds, not out of taxes, this need usually is tied up with a bond election.

"Therefore matters have to be explained to the voters. The municipal utilities have neglected to do this, as they should have done, regularly over the years. So they call on me.


Don Morris

"Specifics? Take Brownsville, Texas, my home town. Brownsville wanted to cure a tendency to give political patronage through municipal electric, water and sewer department jobs. It decided the way to do this was to set up an independent Utilities Board, not responsible to elected officials.

"This proposed board could be established only by a vote of the people. I was called in to help explain it because what we euphemistically called 'outside interests' were spending a lot of money trying to dis-explain it and beat the proposal. We won, by a very thin margin.

"Take Greenwood, Mississippi. They were selling power below cost in residential brackets. They tried to explain a proposed rate raise, but who wants to listen to rate raises? They called me in. It turned out that the various press, radio and television media were eager to tell the story but were understaffed so they couldn't devote days or even weeks to researching the story. I researched it. The press and other media checked against me to make sure I wasn't giving them a bum steer—something I never do—and the story got told. The rate increase passed.

"Take Brownsville again. After the Utilities Board was established, there was pressing need for an $8-million revenue bond issue for improvements. Again I was asked to develop a public information campaign. The issue passed 3-1 and a 22,000-kw steam generating plant is now under construction.

(Continued on opposite page)

To secure lease on 45,000-sq ft exhibit site at the New York 1964-65 World's Fair, a check for $90,000 covering half of first year's rent changes hands—Fair Corp. V-P J. A. Panuch (second from left) receiving it from Harold S. Sutton, treasurer of Power & Light Exhibit, Inc., and of ConEdison of N. Y. At left: Ernest R. Acker, president of P&LE and chairman of EEI World's Fair Committee and of Central Hudson G. & E. Co.; at right; EEI's Edwin Vennard.

ECONOMIC OUTLOOK

BY A. C. FARMER
ECONOMIC CONSULTANT

The Current Psychological Barrier to Rapid Economic Recovery

In the post-war period of World War II, the Federal Reserve Index of industrial production (1947-49 = 100) has been responsive to periodic changes in the Federal Reserve Discount Rate.

In the post-war period it has been true also that the expansion of the total volume of money in the economy has been the result of the increase in the bank loans at the commercial banks. (Refer to article "The Tides of Money in 1961"—EL&P, April 15.)

The changes in the Federal Reserve Discount Rate have the effect of stimulating or discouraging the borrowing of money. When the Federal Reserve Discount Rate was lowered in 1954 and in the period November 1957 to April 1958, the changes were followed by a rapid increase in bank loans at the commercial banks; while the steady increase in the discount rate from 1955 to 1957 and from 1958 to 1960 finally had the effect of slowing up the expansion of bank loans and of slowing up, in consequence, the expansion of general business activity as measured by the Federal Reserve Index of Industrial Production.

In June 1960, the Federal Reserve Discount Rate was reduced from 4 to 3½-percent, and in August 1960, from 3½-percent to 3-percent.

No further changes downward have been made, and it is quite evident that the failure to reduce still further the 3-percent discount rate has been a barrier to the rapid economic recovery of general business activity from the slow-up that began early in 1960.

The situation largely is psychological. In the Foreword to that remarkable work "Extraordinary Popular Delusions and the Madness of Crowds," by Charles Mackay, Bernard Baruch has written:

"All economic movements, by their very nature, are motivated by crowd psychology."

Two facts can be cited in proof of this fact in connection with the current discount rate of the Federal Reserve Bank.

(1) It can be shown that once the discount rate has been lowered sufficiently to start an increase in the loans at the commercial banks, the trend of borrowing continues upward even though the discount rate thereafter steadily is increased; for example, from 1955 to 1957 the rate was increased from 1½-percent to 3-percent before the rate of borrowing was reduced, and from 1958 to 1960 the rate was increased from 1¾-percent to 4-percent before the rate of borrowing was reduced. Once a borrowing procedure is started, crowd psychology keeps it going.

(2) In the 1920's, the discount rate never was lower than 3-percent, and flunctuated, in general, between 3½- to 4-percent. (In 1928 it was increased to 5-percent, and in 1929 to 6-percent—and this was followed by a devastating national liquidation.)

In the Historical Supplement to the Federal Reserve Chart Book dated September 1960, the chart on page 40 supplies this information in detail from 1919 to 1939. And, on page 92 is a chart of the Index of Industrial Production (1957 = 100) over the same period of time. Comparison of these two charts, on page 40 and on page 92, shows that changes in the Federal Reserve Discount Rate bore the same relationship to changes in the Index of Industrial Production as has been the case in the post-war period of World War II.

If the Federal Reserve Discount Rate could be reduced to 2-percent, it would break the ice immediately. Bank loans once more would begin an up-trend, and once started, this would continue, even though, as in previous situations, the discount rate once more steadily was increased. Immediately this would be the end of the current business recession.

However, the current business recession will come to an end when a base rate of 3-percent generally is accepted in the world of business as safe and satisfactory and the related interest rates similarly safe and satisfactory for expanded borrowing, as an even higher rate—3½-4-percent—was accepted in the twenties, so that it proved no obstacle in that period to the expansion of bank loans. Therefore, it is possible to foresee that an up-trend in general business activity will become apparent just as soon as it becomes the general conclusion of business and industry that it is a safe procedure extensively to expand borrowing at present commercial loaning rates. As previously stated, however, a reduction of the Federal Reserve Discount Rate to 2 percent would be the most effective method immediately to stimulate an up-trend in the American economy.

Public Understanding . . *Cont.*

"Take another Southern city, which I cannot yet name because the case is pending. They are up against a growing sentiment, by no means spontaneously generated, to sell a municipal system to private interests. If I take that one one, I will be in direct battle (again) with private power interests, but without any animosity. I think I can help win.

"All this constitutes a relatively new field which I call 'the engineering of public understanding,' having great faith that when the public understands, it will vote favorably.

"Why don't municipalities do it themselves? I can only quote Greenwood, Mississippi, where the last question I asked before taking on their campaign was: 'Are you *sure* you can't do all this yourselves?' They replied: 'We tried it ourselves. Come on up.'

"Municipal utilities, which I help, ought to want to put me out of business. They could, simply by keeping their public relations fences mended year-round—that way they would never need me," observes Don Morris in an advisory aside.

WASHINGTON OUTLOOK

BY RALPH ELLIOTT
WASHINGTON EDITOR

It's Still Socialism

Back in the early 1940's some Republicans in Congress were giving a hard time to a man in government service named Stephen Raushenbush. Although tagged repeatedly as a strong leftist from way back, Raushenbush, like some others with similar leanings, continued for several years to thrive in the "liberal" climate of the New Deal.

Of his various writings that were cited as a basis for questioning whether he could be a loyal public servant, one stood out. It was a sort of blueprint for engineering a switch to socialism. It assigned high importance to collectivist ability to make inroads into, and be prepared to take over, public utility systems.

Raushenbush's federal job was with Interior Department's Power Division.

In 1946 his opponents on Capitol Hill again took out after him, this time pumping up enough pressure to force his resignation. Little has since been heard of him around Washington. How much of an imprint he left is a guessing matter.

Whatever he may be doing these days, more likely than not Raushenbush is getting a few chuckles over the considerable penetration socialism has made in the electric utility field in this country, and the brightening prospect that under the present administration that penetration is headed much deeper.

The administration's pronouncements of its power policies were greeted openly by the socialist-minded as a heartening signal of a return to better days. And there is new excitement in their ranks over the broadened objectives those policies portend, now that many of the old, bothersome barriers to government sponsored tax-free competition with taxpaying businesses have long since slipped away into a quicksand of political indifference.

A hurried program to implement those policies is marked so far by plans for early construction of all-federal transmission systems to distribute power from the immense Colorado River Storage Project and the Trinity Division of the Central Valley Project in California. Consideration is being given to construction of part of the 230-kv Trinity system so it could be converted to 500-kv and become a section of the federally proposed Pacific Northwest-Pacific Southwest intertie. Feasibility of the intertie is under forced draft study by a five-man Interior task group headed by Bonneville Administrator Charles Luce. The facility would be a key link in the envisioned giant power grid. Other links are in the planning stage.

Not yet in the open, but under study, are plans for government thermal plants for integration with Western area hydro facilities. If Congress balks, an alternative, while attempts are made to soften up the federal plant objectors, may be a stepped-up play for construction of some such plants by REA-financed super co-ops.

Another matter getting much attention is the broadscale development of pumped storage as a means of increasing federal system ability to meet greater peak loads.

Some touchy problems for the investor owned industry were raised when President Kennedy called for Interior Department planning of "national cooperative pooling of electric power, both public and private." The areas lending themselves most readily and logically to major public-private pooling are the very ones where the government is most active in developing the big public grids. The strategic disadvantage to private companies of declining to pool is obvious. Yet, at the rate things are going, if they do pool they likely will go in as, or soon become, junior partners in a federally dominated setup.

Some top federal power planners are making no bones about the government's assuming a vast utility responsibility, and how they intend to go about beefing up the federal power network. Take, for example, the following excerpts from a talk by Kenneth Holum, Assistant Interior Secretary for Water and Power, at the recent annual convention of the National Farmers Union:

"I believe it has been made amply clear that this administration will not ignore the problems of preference customers in helping them meet future power supply needs. We do have responsibilities to the patrons—individual and otherwise—of cooperative, municipal and public electric distribution systems . . . I can tell you with confidence that we will coordinate our efforts more closely with preference customers than has been done in the past. I refer to both project development and transmission line planning."

"We need to plan for the interconnection of our Federal systems, pooling with other agencies, and interchange arrangements with other segments of the power industry. . . . Extra high voltage, interregional common carrier interties appear to be basic to making the Nation strong electrically."

"As we move ahead into the real electric age, we will find our hydroelectric power far too precious for base loading. Its real value will be found in peaking base loaded thermal generating stations. As this occurs, we shall plan carefully and work closely with the preference customers to make certain that maximum efficiency is achieved."

What it all points to is not so much making the Nation strong electrically, as making the government competitively stronger electrically. Despite the high-sounding, politically sweetened objectives, it's still socialism.

Incidentally, Theodore Sorensen, Special Counsel to President Kennedy, has received a detailed proposal for speeding up the pace of resource development.

It is highly doubtful the proposal will make any headway. Its chief significance is its indication that organizations like the Public Affairs Institute (which originated the proposal) feel the political climate is right for getting back in business as influencers of government planning.

Public Service of Indiana Has Rates Hiked by the Indiana Commission

1. **Rate increase of $4,998,456 granted. This is 96-percent of amount originally requested.**
2. **Fair value rate base 6-percent in excess of net original cost.**
3. **Commission found rate of return to be 5.9-percent but adjusted it downwards to 5.63-percent because of deferred Federal income taxes.**
4. **Attempt by intervenors to impute higher debt ratio denied.**
5. **Company's proposal not to increase rural Cooperative rates approved.**

This Order is interesting in a number of respects, particularly with regard to the Indiana Commission findings on the matter of deferred Federal Income Taxes and as to its position on the use of hypothetical debt ratios.

The Company's proposed rate increase of $5,230,000 was based on a 6½ percent return on the fair value of the property. There is no indication from the rate order that the petitioner offered any proof of fair value. In any event, the final amount of $4,998,456 which the Commission allowed is 96 percent of the Company's original request.

Fair Value Rate Base

In making an original cost determination, the Commission noted that the reserve of some $53.2-million against a gross original cost of plant was $12-million short of an estimated observed depreciation requirement determined by the Commission's staff. The Commission's opinion noted in part that: "There is no contention that the book depreciation rate is too low. We believe that in fairness to all parties the actual accrued reserve should be considered and used in connection with the original cost figure. However, the difference between book and observed depreciation has been fully considered in arriving at the fair value as hereinafter stated."

The Commission noted that the Company's claim for an RCND rate base amounted to $530.1-million as of June 30, 1959. The order noted in part that the Commission then reduced this amount

". . . . . by over $12-million to eliminate estimated piecemeal construction costs deemed to exist in the original construction conditions, and finally depreciated to eliminate effects not only of physical wear and tear, corrosion and other deterioration, but also of obsolescence and to exclude all costs or portions of cost in excess of those attributable to modern economical facilities for performing electric utility service."

If the above $12-million which was eliminated from the RCND is the same as the $12-million which is the difference between the book reserve and the reserve requirements previously mentioned, then such an adjustment seems to make little sense. It is difficult to see how this deficiency in the reserve requirements can be related to the physical conditions of the property enumerated or the adjustment for the piecemeal construction cost referred to by the Commission. It is of interest to note that there appears to be an attempt by the Commission to introduce a substitute plant theory when it makes mention of the fact that it has eliminated those costs in excess of " . . . those attributable to modern economical facilities for performing electric utility service."

Deferred Federal Income Taxes

While the Commission allowed the normalization of taxes, it did make an adjustment to the overall rate of return by imputing zero interest to the reserve of $17.1-million for Federal income taxes. The Commission first determined a fair rate of return of 5.9 percent, and then deducted .27 percent for the interest free component on the above reserve. The adjusted rate of return of 5.63 percent on fair value is equivalent to 5.95 percent on net original cost rate base. In rejecting the claim of the intervenors that the reserve for deferred Federal income taxes should be deducted from the rate base, the Commission Order noted in part:

"It is the conclusion of this Commission that the Congressional intent in passing Sections 167 and 168 of the Code should not be frustrated by this Commission insofar as Indiana utilities are concerned. The prior Commission wisely authorized the normalization method and we adhere to that policy. We do conclude, however, that it is an uncontrollable fact that additional capital is made available for expansion at no additional cost and we cannot and will not overlook this factor in surveying the cost of money evidence. It is not legally necessary to make an express finding as to the precise cost of money, either historical, current or composite, to this utility. We do hold that the deferred income tax account has been considered, along with all the other evidence pertaining to cost of money, in determining the rate of return to which this Petitioner is entitled, with the obvious effort of lowering the rate of return from that which it would otherwise be had the Petitioner not elected to pursue Sections 167 and 168 of the Internal Revenue Code. This position has been expressed also by the Kansas and Washington regulatory commissions (See 23 PUR 2d 45 and 33 PUR 3d e68)."

Debt Ratio

The intervenors in this case had proposed that the Commission order the Company to increase its debt ratio, and thus raise additional funds for servicing capital additions. The Commission noted:

"Although not mentioned specifically in Intervenors' brief, increased debt financing is sometimes argued to reduce cost of money computations."

The Order continued:

(Continued on page 66)

"RELUCTANCE OF MOST UTILITIES to accept the financial burden of our present cooperative program," along with delays due to choosing reactor sites and problems of safety related to this, have tended to hold back the nation's nuclear power program, Commissioner Robt. E. Wilson observed in testifying for the AEC in the annual "202" hearings before the JCAE. He suggested that if safety standards were changed, it might be desirable to have the government stand more of the cost.

IN THE HEARINGS ON THE HILL, in which the state of the atomic energy development is assessed annually as a requirement of the Atomic Energy Act, these were among more significant points made: Best hope for a permanent solution to man's energy supply problems is in the breeder reactor, according to *ORNL's Director A. M. Weinberg;* attractive as it was when it was begun three years ago, says *AEPC's Pres. Philip Sporn,* is the Florida utilities' proposed project for constructing a gas-cooled, natural uranium, heavy water-moderated reactor (though the AEC has expressed a desire to terminate its contract with the Florida groups); and *Battelle's Dr. Russell W. Dayton* sees possibilities for reducing reactor fuel cycle costs by as much as 50-percent.

FIRST THERMONUCLEAR GOAL: Reaching ignition point in operation of multiple compression magnetic mirror machine (Toy Top III) at AEC facilities in Livermore, Cal., would enable scientists to proceed to the second goal: development of a fusion reactor that would yield more power than it consumes—a goal that may be only weeks away, AEC Commissioner Graham told the JCAE.

NEW FORGED ROD FUEL ELEMENT PROCESS, a cost-cutting fabrication technique recently announced by *Babcock & Wilcox* "promises a less expensive reactor component with greater output and longer core life potential—a step toward more economical atomic power," says B & W. Eliminating costlier processes of pressing, sintering grinding, and inspection of individual pellets, the new technique vibrates uranium dioxide powder into hollow rods, which are then forged to final diameter.

SMALL PRESSURIZED WATER REACTOR project, on which the AEC received proposals from co-ops and public power organizations, has been terminated. Proposals were rejected, says the AEC, because the utilities needed to procure sites for the 15- 20-megawatt plants sufficiently remote from population centers to meet current site safety criteria . . . and increased costs involved indicated that the "economic potential for the project in the reasonably near future did not warrant proceeding." (Increased costs resulted from extending utility lines, additional transmission lines and substations, and substantially increased site development costs, the AEC noted.)

"SPECTRAL SHIFT CONTROL" concept is being tested for feasibility with series of critical and exponential experiments, following AEC approval of the experimentation at the Babcock & Wilcox Critical Experiment Laboratory at Lynchburg, Va.

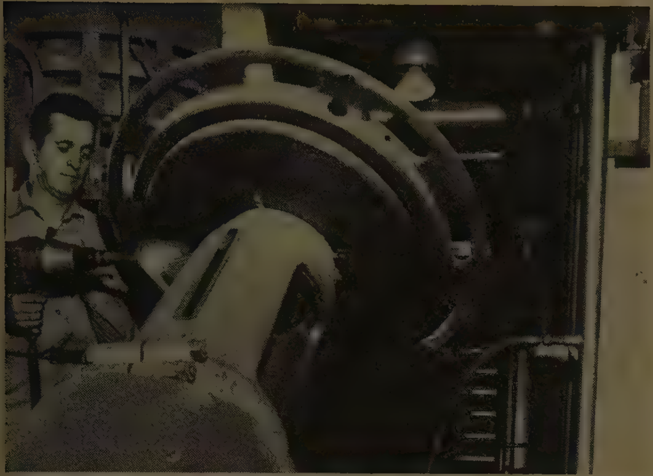
TESTING: NON-DESTRUCTIVE, IN-PILE—In these areas of research effort, very important progress has been made in recent years, according to the AEC's U. E. Staebler. Stating recently that "there is no shortage of material problems in the reactor field," Mr. Staebler indicated that developments such as are coming from R & D test activities are vital to the maintenance of quality standards which are so important to the nuclear industry. He added: In R & D for reactor materials, the consideration of economics introduces a new challenge—a challenge which the industry must meet.

IMPROVED CYCLE BWR PROJECT has been delayed, after withdrawals from the bases for cooperative first arrangements by the cities of Los Angeles and Pasadena and then the AEC, which announced recently that it is considering alternate courses of action for the project. The expected increase in the cost of power from the site for the proposed 50,000-kw plant in Haskell Canyon, Los Angeles county, California — due in part to the possibility of not being permitted to use the site for a larger nuclear power complex, as well as to higher fuel, operation and maintenance costs not anticipated at the time of the cities' proposal to the Commission — was given as the reason for the withdrawal action by the municipal agencies.

N. Y.-OWNED STORAGE FACILITY for nuclear byproduct materials would be operated by private industry, if the state gets a suitable proposal from a potential contractor interested in undertaking a related privately-sponsored processing, manufacturing or research activity in the vicinity of the site. The proposed facility, for which the state has already appropriated $300,000, would be the first non-AEC site, to be located in one of three places under consideration.

COMMITTEE ON PUBLIC UNDERSTANDING being formed by the Atomic Industrial Forum is to be "broadly representative of industry, labor and the universities," according to AIF Pres. Charles Weaver. N. Y. state's atomic development chief, Oliver Townsend, is heading the new group, which will endeavor to increase public understanding of developmental and safety aspects of atomic energy.

ENGINEERING-OPERATIONS



Portable-powered air-actuated valve operator cuts valve operating time from 15 minutes to one minute at large Midwestern utility. Valve is equipped with the Impactogear air-powered operator by Edward Valves, Inc., subsidiary of Rockwell Mfg. Co. Impactogear is a pinion-and-ring-gear mechanism driven by a portable air motor to move the valve stem between open and close. Final seating is accomplished with the conventional Impactor handwheel.

Decoder Digitalizes Trouble

A decoder device recently installed in Iowa Electric Light & Power's system control center notifies dispatchers of trouble at any one of six unmanned substations within seconds of its discovery. The unit automatically transforms a radio tone signal via a directional antenna beamed at Cedar Rapids to printed code numbers. The tone signal and code number correspond to one of the six substation locations.

The decoder resembles an adding machine, and the code numbers are printed on tape. Equipment at the source of the difficulty starts transmitting radio waves for a number of causes. A loss of power due to any circumstances is enough to set the motors running.

When the message arrives at the system control center, the men know by the code where the trouble is. They then check the charts to see if the trouble has resulted in a load loss. The location and probable cause is relayed to the operating department involved.

Operation Skyhook Takes 25 Minutes

Twenty-five minutes of flying within a course smaller than an acre was all it took for a Hiller 12E helicopter to erect a new type metal powerline structure, according to reports of a recent contract completed on a 115-kv line for Portland General Electric.

The job called for placement of three 63-ft aluminum tripod towers. The 450-lb towers—which represent a load far below the 305-hp Hiller's capacity, replace wooden poles weighing seven to nine times as much and which are not permanent. In operation, the helicopter spotted each tower on a designated foundation. Once the ground crew had bolted it firm and secured the guy lines, the tower was released by an electrically-operated cargo release hook.

Once the three poles were spotted, the helicopter flew tubular aluminum cross bars to positions atop the towers where linemen bolted them in place.

Reporting Plan Gets All Employees To Help

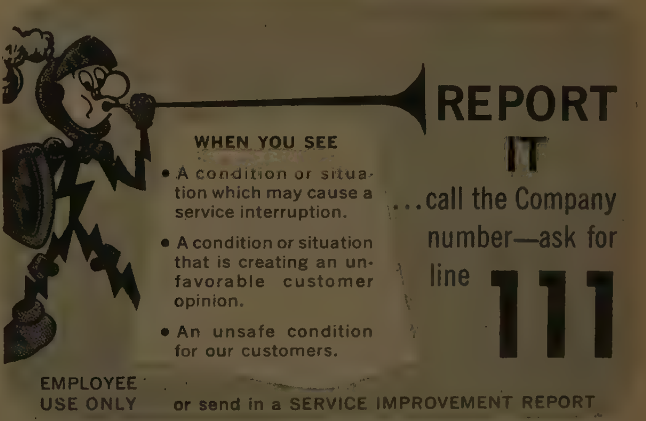
Did you ever see an overloaded transformer light, report it, and then wonder if *they* ever did anything about it? Any such doubt has been eliminated at Cleveland Electric Illuminating by its Service Improvement Reporting Program.

The plan gives employees an opportunity to report quickly and easily situations which they feel need attention and which can help improve service. These situations are items that may cause a service interruption, create unfavorable customer opinion, or are hazards to customers. They can also be questions or complaints about company service from friends or neighbors.

Reports on a nonroutine condition may be submitted by phone or on a special form. An extension phone number is available 24 hours a day, seven days a week to employees.

Once a report has been made, it is channeled to the proper department. Then, the condition is investigated and proper action taken.

The "loop is closed" when the concerned department reports back to the initiating employee on results of the investigation or action taken.



WHEN YOU SEE

- A condition or situation which may cause a service interruption.
- A condition or situation that is creating an unfavorable customer opinion.
- An unsafe condition for our customers.

REPORT IT

...call the Company number—ask for line 111

EMPLOYEE USE ONLY

or send in a SERVICE IMPROVEMENT REPORT

Card for employees reminds them to call the company at any time to help improve service. There were 541 reports through the first week in April since the program started January 16.

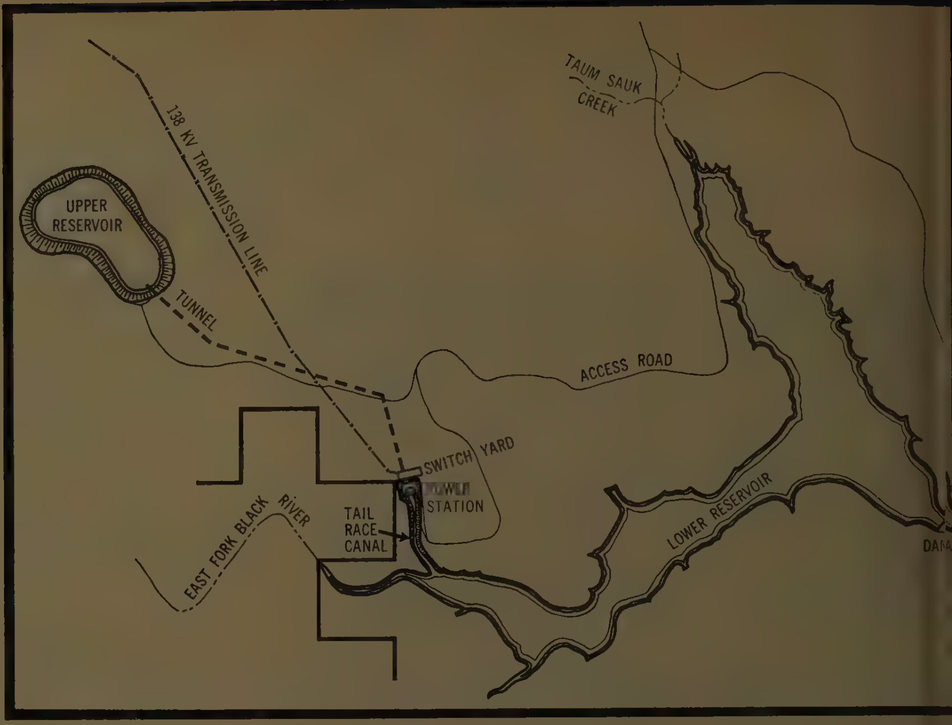


Fig. 1—General plan of the Taum Sauk pumped hydro storage plant showing relationship of upper and lower reservoirs, tunnel to power station, and connecting 138-kv transmission line.

Considerations in Applying Hydro Pumped Storage to An Interconnected System . . .

The TAUM SAUK DEVELOPMENT—Part 2

Any utility with little or no peaking capacity but with terrain which permits sufficient hydraulic head should consider the pumped-storage principle; among other benefits are lower investment and smaller payroll than for alternate steam capacity.

By G. J. VENCILL, Chief Hydraulic Engineer, Union Electric Company

ADVANTAGES in being able to store output of electric plants have long been recognized, but until recently no workable storage system has been devised to enable off-peak kilowatthours to be saved until a later peak period. Development of a reversible pump-turbine has greatly improved the economics of such projects.

Union Electric Company has been interested in the pumped storage process since late in 1953 when a search was started for a possible site. Topographic maps covering a large area were scanned and a number of prospective locations investigated. Other methods of providing peaking capacity were also considered, but under existing conditions were not as advantageous as the pumped storage hydro method. These include small diesel installations, gas turbines and steam plants designed especially for peak operations.

In December 1959 the construction of the Taum Sauk energy storage project was authorized by Union Electric Company, subject to receipt of regulatory approvals. Work is now in progress on detailed design, and field construction is well under way. A Certificate of Convenience and Necessity has been granted by the Missouri Public Service Commission. A Declaration of Intention is pending before the Federal Power Commission.

The Taum Sauk project has two main units which will be both the largest pumps and the most powerful turbines yet built. It will be the first large installation in this country to be purely pumped storage, since it will have no energy available from stream flow and no other associated special features such as those at Niagara Falls.

To determine application of peaking capacity to future loads, it was necessary to determine prospective loads for several future years. Typical load distribution for various weeks of the year has been determined by a computer program for the IBM 650 Computer which compares load curve shapes by weeks over past years and selects the weekly curve most nearly representative. Long-term changes to be expected in daily and weekly load factor are also important since the amount of energy necessary to support a given amount of peaking capacity is very sensitive to load factor. While the long-term trend in load factor is not definite, it seemed fairly safe to assume that any future change would not result in higher load factors, but that the prospects are for little change and possibly decreasing load factors.

It is important to notice that in operating the proposed storage facility, daily and weekly load factors are primarily important rather than monthly or annual load factors. The storage project will be operated on a daily cycle, being restored to full reservoir level each night, with some weekend storage when it is more economical to defer pumping and use low cost energy available from other sources on a Sunday.

The amount of other peaking capacity already available on the system definitely affected the prospective use of the pumped storage plan. There is approximately 200 mw of peaking capacity in the company's Osage Power Plant and full advantage must be taken of this before additional peaking capacity can be economically justified. It is also necessary to consider energy which will be available under economy interchange agreements from interconnected companies. Use of such interconnection agreements makes use of a substantial amount of energy possible for storage pumping at a lower cost than that available from our own plants.

Long-term studies show that 350 mw of peaking capacity can be used on the system, and that energy storage of 2,200,000 kwh will be required to support this capacity under the most critical conditions to be expected. This represents 6.3 hours use of full capacity although actually fitted into the load curve the plant will operate at varying loads up to 9 or 10 hours per day during peak weeks. In order to have a margin of reserve, storage of 2,750,000 kwh was provided in the plan so that use of the rated storage will not leave the project completely discharged. Once the capacity is provided, it will be possible to operate on an economy basis a great part of the time.

Overall cycle efficiency of the storage process including transmission is about 65 percent, so, whenever energy might be available for pumping at less than two-thirds of the incremental cost of on-peak energy, it will be economical to use the stored water to a greater degree than will be absolutely necessary to carry the peak, and then replace it the following night at an overall saving. The dispatching of this energy and accurate information on incremental costs become important as well as ready use of energy which can economically be purchased from neighboring systems.

Economic Comparisons

In determining economic validity of incorporating a pumped hydro plant in the Union Electric system, annual costs of a plant with two 175-mw pumped hydro units were compared with those of one 350-mw steam unit, transmission costs being included in both cases. Costs for the 350-mw steam unit were based on one-fourth of the costs for a four-unit plant, each unit of 350-mw capacity. Principal items included in the cost comparison were cost of money (including income taxes), depreciation, property taxes, manning charges and a production cost penalty against the pumped hydro plant. This last item is occasioned not only by the losses in the pumping-generating cycle, but also by the fact that low-cost kilowatt-hours from the new steam capacity would replace considerable off-peak generation at older plants at a considerable saving. Depreciation was computed on the sinking fund basis, using estimated service lives for the respective facilities. The sinking fund basis produces a more valid comparison than does the straight line method where units of such greatly differing service lives are involved.

A comparison of annual costs was also made on two different expansion programs as they might be reflected in our books. The period covered was 12 years beginning with the first full year of operation. One program was based on the pumped hydro project followed by 350-mw steam units. The other was based on 350-mw steam units solely. Escalation was assumed based somewhat on past experience. Straight line depreciation was used and the amounts accumulated as depreciation were deducted from the original cost to arrive at "net investment" upon which cost of money was computed.

Lower Investment

Both comparisons showed substantial annual savings in favor of the pumped hydro project. The greatest single factor is lower investment. Actual bid prices on construction of the Taum Sauk Project indicate a cost of $143 per kilowatt including the necessary transmission system. The cost of alternate steam capacity, unescalated, is ap-

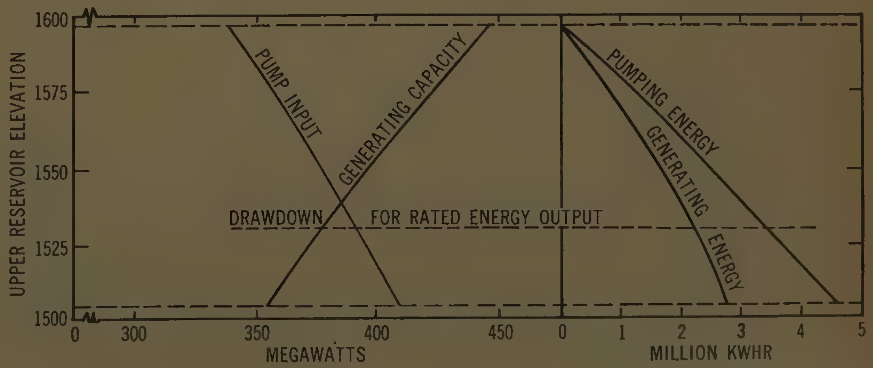


Fig. 2—Operating characteristics of Taum Sauk plant plotted in terms of elevation of upper reservoir illustrates how generating capability decreases as the reservoir is lowered and how input to pumps increases.

proximately $175 per kilowatt which is the average for a complete multi-unit plant, including transmission, while cost of the first unit carrying all the site development expenses would approach $200 per kilowatt.

Other possibilities to be considered in the comparison of economics include the effect of unforeseen economic recessions or rates of load growth materially different from those used in the cost comparisons. The pumped storage plant has the advantage in case a severe business recession should develop after it is in operation, since the money invested is considerably less than the alternate steam capacity, and the payroll to be carried is also much smaller.

Description of Project

The Taum Sauk Project will be located approximately 90 miles south-southwest of St. Louis near the town of Lesterville, Missouri. A pool with an area of 390 acres will be created on the east fork of the Black River by a concrete overflow dam 60 feet high. See Fig. 1. This dam will have a valve or sluice gate to provide for passing the normal flow of the river at all times, and a free-crest spillway at elevation 750 for flood passage. The upper storage pool will be created by removing the top of a granite hill to elevation 1505, and using the material obtained to build a rockfill dam around the top of the hill. Volume of fill required is 3,500,000 cubic yards. The upper pool will be provided with a concrete face and an eight-foot parapet wall on the top with maximum water storage to elevation 1597 and surface area of 54 acres. An intake in the bottom of this reservoir will lead into a shaft and tunnel 6800 ft long to connect with the power plant site near the upper end of the lower reservoir. Approximately 4800 ft of the tunnel will be 25.5 ft in diameter, horseshoe shape and unlined, and the lower end will be provided with a steel lining which connects with the penstock and a Y-branch to serve the two generating units.

It is considered a significant feature of this plan that no intake gates or screens are provided since the storage in the reservoir can be used in a few hours, and any necessary inspection or maintenance work done on the tunnel and penstock can be accomplished with an empty reservoir. Likewise, repair work on the concrete face of the upper reservoir can be done by draining the reservoir completely.

The power installation would consist of two generator-motors, each connected to a reversible pump-turbine with a spherical valve connecting it to the Y-branch. Each generator-motor would be directly connected to a 13.8/138-kv transformer on a separate 138-kv transmissions line. Interlocked disconnects are required to reverse phases on the high side of the transformer to provide for reverse rotation of units in pumping and generating directions.

To operate the units as pumps, water in the draft tube is depressed by admitting compressed air through the head cover until a float switch in the draft tube indicates that water level is at the desired location, then the unit is brought up to normal operating speed of 200 rpm by means of a 12,000-hp wound-rotor induction motor mounted on the shaft. After it is synchronized with the incoming line, water is admitted to the pump gradually in order to minimize disturbance to the electrical system in picking up a large amount of load rapidly. Air is discharged through vents to allow the pump to prime. After this operation is completed, wicket gates and spherical valve are opened to start the pumping process. Starting the units in the generating direction is conventional by means of the wicket gates and the turbine governor.

To obtain satisfactory cavitation characteristics in the pump, it will be necessary to set the unit so the center line is 32 ft below minimum lower pool level. This low setting requires that draft tube gates be provided to close the discharge openings when the unit is unwatered for inspection or maintenance.

Operating Characteristics

Operating characteristics of the plant are shown in Fig. 2. This is plotted in terms of elevation of the upper reservoir and shows that generating capability decreases as the reservoir is lowered while input to the pumps is higher for a low reservoir. Maximum pump input with two units operating is expected to be 410 mw decreasing to 340 mw at full reservoir. The dependable rating of the plant depends on the amount of energy required to carry a given system load and generating capability remaining after that energy has been used. It was determined that 2,200,000 kwh would be required to carry the load allotted to the plant on a critical day, and that a capability of 350 mw could be used. With the information available now on expected machine performance, there is a five percent margin in capacity at the reservoir level determined by the rating. With the two-unit plant rated at 350 mw, it is seen that the electrical machines must be rated higher than this to cover required pump input at low reservoir. Generator-motor rating is 204,000 kva at 60-C rise each. This excess capacity required is not considered a disadvantage since more than 350 mw generating capacity will be available a large portion of the time, and will be useful in carrying short time loads. It is expected that future system load growth will increase dependable capacity of the plant based on a definite number of kwh in storage, and in future years the rating could be considerably higher than 350 mw.

Operation of the Taum Sauk Plant will be on a daily cycle. Energy used from storage each day will be pumped back during the following night. The amount of energy used is an economic choice depending upon cost of alternate energy and cost of energy expected to be available during the night. It may prove economical to defer repumping of part of the energy used on Friday until Sunday or early Monday morning to obtain the advantage of a lower cost supply. Repumping of the reservoir from rated drawdown can be accomplished using both pumps in 9.8 hours, and even if the reservoir is emptied completely, it can be filled in 12.3 hours.

Performance characteristics of the major hydraulic equipment have been agreed upon, and work is progressing rapidly on specifications for remaining equipment. The plant is scheduled to be completed and in operation before the summer peak period in 1963.

Conclusions

The pumped storage type of development appears to have a very bright future. A number of major projects are known to be seriously considered in this country and the actual construction of a few will undoubtedly cause many other utilities to investigate similar possibilities. If load conditions such as load factor and seasonal distribution continue essentially unchanged in the future, we believe that about one-fifth of future generating capacity can be in the form of peaking capacity of which pumped storage is one of the leading possibilities. This seems to be especially true in connection with nuclear power plants. The economic justification of large nuclear stations would seem to be in a combination of low incremental energy cost, and higher first cost and fixed charges than conventional thermal installations. Peaking capacity in the form of pumped storage forms a very good combination with nuclear plants by using low cost off-peak energy to supply the top portion of the load curve at a cost per kilowatt of capacity lower than the unit capacity cost in a nuclear plant. Any utility with little or no peaking capacity and with terrain which permits development of sufficient hydraulic head can consider seriously the pumped storage principle.

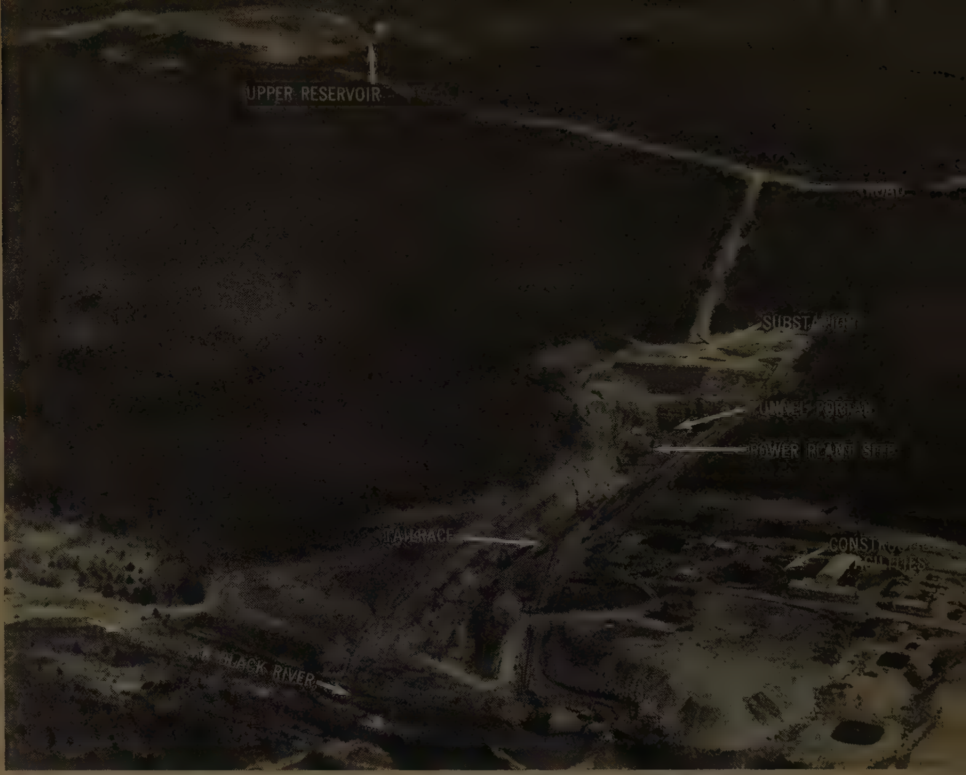
Pure pumped storage schemes seem to require high heads (500 ft or more) to be economically feasible, since high heads minimize the required size of reservoirs, tunnels and other features. Where pumped storage can be combined with other hydro projects, or if topography is especially favorable, heads as low as 200 to 300 ft may prove feasible.

References

Symposium on Pumped Storage, Adolph J. Ackerman, George R. Rich, Edward S. Loane, G. J. Vencill. Proceedings of the American Power Conference, Vol. XX, 1958, pp. 385-417.

West Germany Makes Pumped Storage Hydro Power Work, Rudolph Meister, Power Engineering, Barrington, Illinois, May 1959, pp. 80-81.

300-Mw Pumped-Storage Plant to Supply Peak Demand on Daily Cycle, V. G. Newman. Electric Light and Power, Chicago, Illinois, October 15, 1959, pp. 78-84.



Actual photo of Taum Sauk installation area showing location of various major components.

Drilling jumbo enters tunnel portal near site of power station.

Rock fill is sluiced into place during preliminary forming of the upper reservoir at Taum Sauk.

WHAT SERVICE VOLTAGES IN THE FUTURE?

Service and utilization voltages which will be in effect in the year 2050 are dependent on plans the utility industry chooses now. The economic stakes are tremendous.

By A. S. ANDERSON, Electrical Engineer, Ebasco Services, Inc.

THE increase in electrical consumption in the home in the last decade has been fantastic. More impressive still is the prediction that the *average* residential usage by 1975 will be 10,000 kwh per year. With such load growth possibilities we cannot expect to perpetuate the same voltage level that Edison selected some 80 years ago.

We are now approaching the economic limit for the 120-volt systems and we should be thinking in terms of a higher level. Nearly all of Europe and significant groups of the other continents have not only considered the problem but have gone to higher levels. The level used in continental Europe is 220-volts-to-neutral, in Australia both 230-volts-to-neutral and 240-volts-to-neutral, and in England 240-volts-to-neutral. Sweden reports nearly 90 percent of energy for domestic purposes is now delivered at the 220-volt level.

There is majority agreement among industry engineers that savings are possible at the higher voltage level in situations where residential consumers have high electric-energy use. With greater usage and higher-cost supply systems of the cabled type, either overhead or underground, it may be expected that greater savings may be effected. Of equal significance is the added capability of the higher-voltage-level systems.

Those in this country who are opposed to the higher level of utilization voltage in dwellings indicate that the economic benefits are not great enough to justify the change. Can one predict that the peak in energy usage has been reached in the Gold Medallion Home of today? Even now hundreds of panel-type and other types of resistance heating units are being installed in public and private schools throughout the country at the higher voltage level. Why?—because of the large savings that are possible. These same large savings can be made in apartment houses and to a lesser but significant extent in the smaller dwelling units.

A Stalemate Has Developed

The electrical industry has studied the value of higher utilization voltage and reported the results in the technical press for nearly a decade. Committees on the subject have been in session since 1954. One of the most interesting and unfortunate stalemates in national committee action has been reached. Let us review the committee action leading to the stalemate and to forecast two possible situations that could exist in the year 2050.

In February 1954, a Task Force of the Transmission and Distribution Committee of the Edison Electric Institute began to study higher secondary and utilization voltages. This Task Force reported back to the Transmission and Distribution Committee in September 1955 and recommended that the 265/460-volt system be used by large commercial and industrial consumers and that the 255/440-volt system be a permissible alternative. It further noted the possibility of extending higher secondary voltages to residential and small commercial consumers.

In July 1956, a Joint EEI-NEMA Committee was formed to consider this subject on a broader basis. After careful study and deliberation for two and one-half years this committee issued a preliminary report in January 1959 to members of the T&D Committee of the EEI and appropriate groups of NEMA. Each co-chairman was commissioned to get comments and expressions of approval or disapproval from his respective body so that the Joint Committee might convene and make its final recommendations. No report has been issued by this Joint Committee.

However, certain action has taken place outside the Joint Committee which indicates the status of this project. The EEI co-chairman made a progress report to the EEI-T&D Committee at its meeting in Houston in October 1959. He reported that he had heard from 33 companies, approximately half of the operating companies represented on the T&D Committee. Statistically a 50 percent sample is more than adequate and reliable, therefore, let us examine the report.

Action Recommended

The preliminary report of the Joint EEI-NEMA Committee included a recommendation that the following be adopted as standard nominal voltages and that steps be taken to revise the "EEI-NEMA Preferred Voltage Ratings of A-C Systems and Equipment" (ASA C84. 1-1954) to recognize these standards:

(A) 240/480-Volt Single-Phase
(B) 240/416-Volt
(C) 265/460-Y Volt (Alternate—Industrial and Commercial Application)

With regard to recommendation (A) only two of the 33 replies were negative.

With regard to recommendation (B) only seven of the 33 replies were negative.

With regard to recommendation (C) only three were negative. However, 11 recommended that 265/460 volt also be standard without the alternate designation.

The nearly unanimously favorable opinion of a very large sample might well be considered a mandate of the utility industry to standardize on 240-volt-to-neutral systems. It seems that the utility industry has generally expressed itself as favoring higher secondary distribution systems to the extent of wishing them to be made standard systems. Furthermore, one-third of the industry would like to see the 265/460-volt wye system also made a

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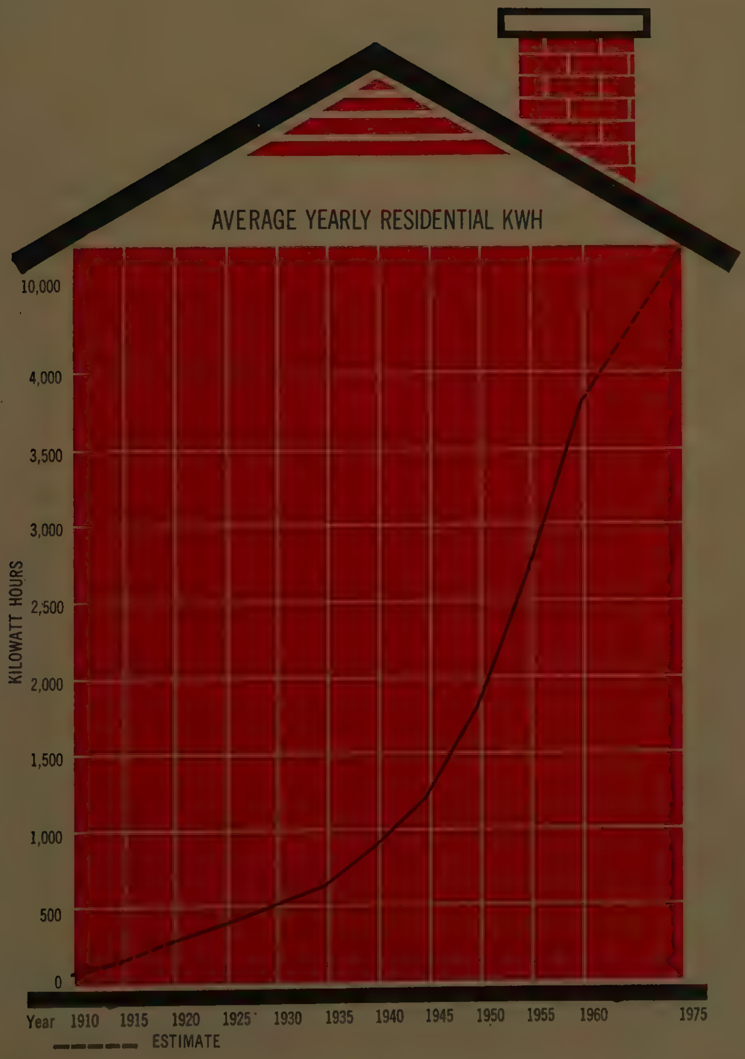
Editor's note—This is the essential text of a paper presented by the author at the 1960 Power Distribution Conference sponsored by the University of Texas.

Table I

FUTURE SERVICES AVAILABLE AND NAMEPLATE RATINGS

Plan A Nominal Service Voltages	Plan B Nominal Service Voltages
240-volt, 2-wire, single-phase	120/240-volt, 3-wire, single-phase
240/480-volt, 3-wire, single-phase	120/208-volt, 3-wire, single-phase
240/416-volt, 4-wire, three-phase	120/240-volt, 4-wire, three-phase
	120/208-volt, 4-wire, three-phase
	265/460-volt, 4-wire, three-phase

Utilization Equipment Nameplate Ratings—Volts (Plan A)		Utilization Equipment Nameplate Ratings—Volts (Plan B)	
Single-Phase	240, 480	Single-Phase	120, 240, 265, 460
Three-Phase	416	Three-Phase	208, 240, 460



standard. In light of its wide usage this of course is to be expected.

By letter of March 19, 1960, the NEMA Co-Chairman of the Joint EEI-NEMA Committee on Higher Utilization Voltages reported the following action by the NEMA Board of Governors:

> "By unanimous vote, the Board of Governors approved the recommendations of the Officers Committee that NEMA reject the recommendations in the Joint EEI-NEMA Preliminary Report on Higher Secondary and Utilization Voltages. The Board instructed, however, that the Joint Committee be advised that, in taking this action, it was recognized that this preliminary report has served a most useful purpose in bringing out the differences of opinion not only within NEMA but also within the EEI, and that therefore final conclusion is premature. The Board also requested the NEMA representatives on the Joint EEI-NEMA Committee to continue study of the problem with guidance from the NEMA Committee on Utilization Voltages and Circuits, which Committee would continue to determine a NEMA position acceptable to all Subdivisions."

This letter was read by the EEI Co-Chairman to the EEI Transmission and Distribution Committee May 12, 1960. The EEI Co-Chairman stated at this EEI meeting that "The EEI representatives are disturbed by the lack of any constructive recommendation by NEMA . . ."

By executive decision it is indicated that the conclusions after six years of research and deliberation by both the manufacturing and utility industry are premature. This prematurity must exist in the engineering aspects of the conclusions since the subject has been referred back to an engineering committee within NEMA. Such a move might not be amiss had the matter been referred to an engineering committee of greater scope and broader interests. Two years have passed since the Joint Committee issued its tentative recommendations.

The present situation is a desirable one to those who favor the 265/460-Y volt systems. Herein lies one of the strangest anomalies that

has ever existed in the electrical industry:

First, equipment standards and wiring code changes have been made and others are contemplated to permit the use of the 265-volt system which is not a standard, is not compatible with the present standard, and is not considered desirable by many.

Second, nothing is being done to promote standards or wiring code changes to permit the 240-volt system which is both compatible and is considered preferable by many.

Third, the higher voltage level 265-volts-to-neutral system cannot displace the 120-volt system economically, therefore both systems will be perpetuated.

Those who favor the 265-volt-to-neutral system conclude that:

a—Higher than 120-volts is not and never will be economically justified for dwellings.

b—Other important economic factors favoring the 265-volt level are: a wider market for 440-volt motors, the better efficiency of the 120-volt incandescent lamp compared to the 240-volt incandescent lamps and the lesser current of a 265-volt circuit as compared to a 240-volt circuit.

c—Higher than 150-volt-to-neutral lighting and appliance circuits should not be used in dwellings. Nor should they be used elsewhere except to serve electric discharge lamps which must be mounted 8 ft from floor.

d—The nominal service voltage should be 5 percent higher than the rated voltage of the motor.

e—Higher than 120-volts to neutral will increase the hazard of using portable appliances.

Those who favor the 240-volt-to-neutral systems conclude that:

a—240-volts show savings for the high-electric-use customer of today and will show increasing savings as load increases in the future plus other benefits associated with the inherent greater capacity of the high voltage level.

b—Appliance costs will not change because of the 240-volt-to-neutral system but at 265-volts the increase would outweigh all other advantages of higher utilization voltage.

c—Other important economic factors favoring the 240-volt level are: the elimination of autotransformers more than offsets the 10.4 percent current reduction of 265-volt circuits, 416-volt three-phase motors will ultimately displace all 208-volt and 220-volt three-phase motors, the present need for 265-volt relays and 460-volt motors will be eliminated, future high lighting levels in the home will be obtained by the more efficient fluorescent lamps instead of incandescent lamps.

d—Nominal service voltage and rated motor voltage should be of the same value.

e—The use of autotransformers is detrimental to providing good service and customer relations and their use will ultimately disappear.

f—The 240-volt level will effect ultimate elimination of present voltage levels.

g—Both 120-volts and 240-volts are hazardous in certain situations and to nearly the same degree. Whatever is done to make 120-volts safer will be equally as effective for 240-volts and be much more effective than keeping the voltage at its present level of 120-volts.

Utilities are primarily concerned with the service voltage that they offer their customers and the voltage rating of the equipment that is served. Looking ahead to the year 2050, it is possible to foresee what these may be. The following prediction is premised on a choice of one of two probable standards of secondary systems and utilization voltages. In both instances, it is assumed that the present 120-volt-to-neutral system remains standard or in use until it is economically obsolete.

The two possibilities are:

Plan A—Tentative Recommendations of the Joint EEI-NEMA Committee as presented on January 1959.

Plan B—Standardization of the 265-volt-to-neutral system only (Which is the present non-standard practice).

In the year 2050, utilities will offer the systems for new service to its residential, commercial and small industrial customers and recommend the voltage ratings for utilization equipment as shown in Table I dependent upon which of the plans we choose now.

The economic significance of the choice between Plan A or Plan B in Table I is so great that its true meaning should be known to every executive in the industry. It transcends in significance many research endeavors that are front-page news.

RG&E
CREATES "INTEGRATED ENVIRONMENT" IN HEADQUARTERS BUILDING

Allocation of 10 watts/sq ft provides 200-fc of seeing efficiency coupled with ample heating and air conditioning for about $10/sq ft.

A MODERNIZATION program is well under way at the Rochester Gas & Electric Corporation's headquarters building which will transform it into a showplace for the most advanced application of an integrated lighting-heating-air conditioning system. Three floors of the ten-story building have already been renovated and five others are expected to have received the improvements within 12 months. When completed, the "Office Space Conditioning" program will have provided modernization that will be up-to-date electrically even in the 70's.

Based upon the premise that better seeing will result in better work, lighting levels will be 200 footcandles throughout working areas. According to RG&E Vice President Leo East, a one-percent increase in employee efficiency will offset owning and operating costs of the integrated system. In this program, air conditioning and space heating will compound the effects of high-level lighting to enhance worker's daily accomplishments.

With a power limit of 10 watts per square foot, the lighting level will be 13 times that of the 1926 installation for only 3.3 times the power consumption, and heat from lamps will provide space comfort in winter except in certain peripheral areas. This wattage will also operate the air conditioning system during summer months and exhaust heat generated by the lamps in order to maintain maximum cooling efficiency.

Lighting

Three different lighting systems have been employed to light the fifth, sixth, and seventh floors. Experience from these will determine the system which will ultimately be installed on the other floors. While all completed floors feature the configurated Power Groove, extra-high-output, rapid-start lamps, spacing and shielding have been varied to obtain different effects. The fifth floor features elements four by eight feet; between elements and in the fixtures themselves white aluminum louvers are installed. On the sixth floor single-lamp Power Groove fixtures are mounted above two-by-four foot grids using Circlegrid louvers as the shielding medium. The seventh floor employs two-lamp Power Groove troffers recessed in a plastic louvered ceiling; louvers are standard Circlegrid between fixtures and a higher-density Circlegrid directly under the lamps. Thus, a slight pattern caused by dual intensity may be discerned on the fifth and seventh floors while intensity is constant throughout the sixth floor.

Air Conditioning, Heating

Air conditioning and heating systems employ much of the same equipment. Under-window induction units with large coil capacity are served from a three-pipe system which provides hot or chilled water as the temperature of the various rooms require. Each room or area

(Continued on page 63)

Concentration on such visual tasks as drafting can accelerate fatigue unless environment is designed to minimize drain upon the nervous system; 200-fc of lighting integrated with radiant heating and a related air conditioning plan makes this RG&E drafting room very comfortable. RIGHT: Lighting plan for RG&E executive enclosure is the same as for the large general office space beyond; located along exterior walls, however, private offices require supplementary peripheral heating to be balanced with heat from lamps.

PUBLIC SERVICE COMPANY OKLAHOMA
PUBLIC SERVICE COMPANY
Be modern...
LIVE BETTER electrically
PUBLIC SERVICE COMPANY OF OKLAHOMA

DIESEL UNIT GUARDS TOWN—ECONOMICALLY

A 2000-kw diesel generator unit cleans up low voltage and bad service continuity problems with relatively low cost.

By **RAY APPLEMAN**
Project Engineer
Public Service Company of Oklahoma

IMPROVED SERVICE with minimum capital investment resulted when a standard diesel electric generating unit was added to the town of Grandfield, Oklahoma's transmission line. Relatively isolated, Grandfield is near the southern edge of the company's territory. Its only supply was a 51-mile-long 34.5-kv line of No. 4 copper conductor.

Between 1950 and 1958, the load at Grandfield had grown from 580 kw to 1560 kw. Peak loading comes during the relatively warm summer months when air cooling equipment is added to the normal load.

The small conductor and miles of transmission line exposure meant poor voltage regulation and frequent service outages for the town.

In 1959, PSC engineers studied the problem, deciding that the most economical way to improve electric service was to install the 2000-kva diesel electric generating unit. See Fig. 1. This solution showed a $65,000 per year saving over the next most feasible solution—a 30-mile 66-kv line from PSC's Lawton substation to Grandfield. (See Table I.)

The only major deviation from the standard unit was the addition of 10,000-kva dead-load pickup capability. The unit primarily is intended to reduce the length of service outages in the area, but does some peaking.

Fault Puts Town On Diesel

When a fault occurs on the 34.5-kv transmission line, Grandfield is automatically isolated from the rest of the system, and the load there is carried by the diesel unit. During peak loads, the unit is brought on manually and operates in parallel with the transmission line.

In case of a transmission line fault, the ocb's at Lawton and Waurika, at the other extremities of the line, lock out. The ocb at Grandfield is tripped by loss-of-potential relays. There is a 15-second delay, though, to give the Lawton operator time to manually reclose the ocb there in case of a transient fault.

Additional contacts on the potential relays supply the dead-line starting signal to the generating unit and trip an ocb that disconnects a capacitor bank from the substation bus.

When the diesel unit has come up to speed, the generator breaker automatically closes and an ocb on the 2.4-kv distribution feeder to Grandfield is opened for ten seconds—then recloses. This limits the dead-load pickup requirements to the load at the refinery and the television station. (See Fig. 2.)

Once the transmission line ocb at Grandfield is tripped, the breaker is removed from service. It returns to service only if the generating unit fails to start or the transmission line has been continuously energized for 15 minutes.

Once the 34.5-kv line has been restored to continuous service for 15 minutes, the generating unit is syn-

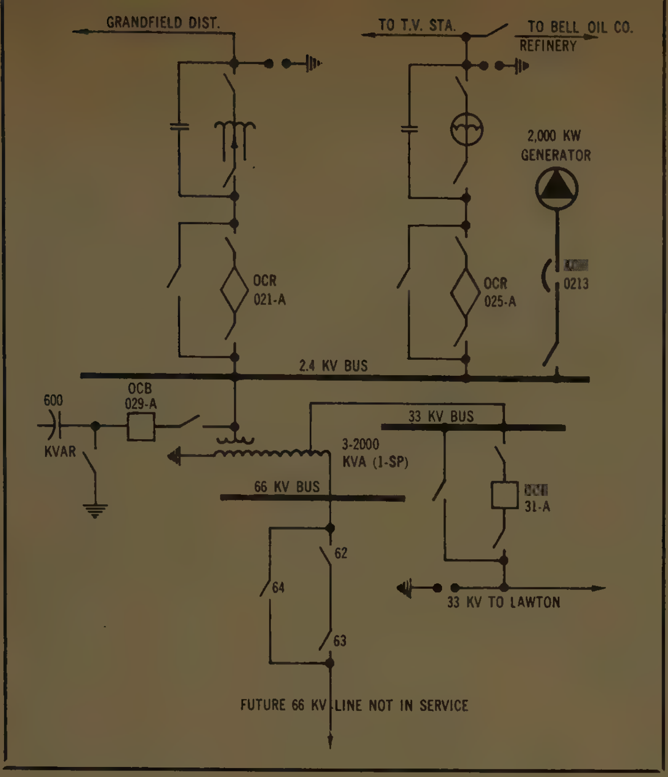


Fig. 1—The automatic dead-load pickup controls on this Public Service Company of Oklahoma diesel peaking plant already have been proven under actual operational conditions. The MU-20, built by Electro-Motive Division, General Motors, provided area protection for a refinery, TV station and the town of Grandfield several times within a few days of its installation.

Fig. 2—One-line diagram of 66/33/2.4-kv Grandfield substation with diesel unit. In case of a fault along 33-kv line to Lawton, ocb in Lawton substation opens. Loss-of-potential relays at Grandfield then open ocb 31a. Opening this ocb trips off capacitor bank 029a. It also supplies starting signal to diesel generator. When generator comes up to speed, acb 0213 closes. Its closing opens ocr 021a which will automatically re-close after 10 seconds. This limits dead-load pick up requirements for generator. When transmission line fault is cleared and line is back in operation continuously for 15 minutes, unit is automatically synchronized with line. Ocb 31a closes; unit operates in parallel with line for three minutes. Then, if no further fault occurs, acb 213 opens and diesel generator shuts down automatically.

chronized to the line. The Grandfield ocb closes and the unit picks up its full load of 2000 kw. The unit will continue to operate for another three minutes, shutting down then automatically—unless a peaking signal is in effect.

Underfrequency Relays Needed

In some cases, when the unit was being used for peaking, transmission line faults some distance from Grandfield would not create enough fault current to trip the ocb at Grandfield. The unit then tried to supply several intermediate loads tapped from the line as well as Grandfield's distribution system. This overloaded the unit, shutting it down, causing an outage to Grandfield.

Under-frequency relays were added to the Grandfield line ocb. When the frequency drops to 58.5 cps, the ocb is tripped and the generating unit continues to carry Grandfield without an interruption.

During the first five months after it was installed, the unit carried the Grandfield load five times for periods ranging from 16 minutes to 40 minutes. On four occasions, the unit was not operating before the fault occurred. The fifth time it was being used for peaking when the fault occurred on the transmission line. Grandfield was isolated from the system and the unit supplied uninterrupted service. An operating report through October, 1960 is shown in Table II.

Since the unit was installed, the longest service interruption to the refinery and the television station has been one minute, five seconds. The town's longest interruption lasted one minute, fifteen seconds.

TABLE I

COST COMPARISON OF 66-kv TRANSMISSION LINE VS. 2,000-kw DIESEL UNIT

2,000-kw Diesel Plan	
Annual Expenses	
Fixed charges on $260, 164 at 16%	$ 41,626
*Fuel cost	8,640
Maintenance cost	2,300
Contracted overhaul cost based on 18 years	3,889
Immersion heating cost	370
Less credit for steam production	—1,920
Total expenses per year	$ 54,905
66-kv Transmission Line Plan	
Annual Expenses	
Fixed charges on $720,000 at 14%	$115,200
Maintenance of line at $150/mile	4,500
Total expenses per year	$119,700
Total savings for 5 years—$323,975	

* Plant operating 3 months during year (June 15 to September 15) 5 days/week, 8 hours/day at 480 hours/yr. at 2,000 kw/hr. = 960,000 kwh at 9 mills/kwh = $8,640/yr.

TABLE II

OPERATING REPORT Mobile Diesel Generator, Grandfield, through October, 1960

Kwh Generated	116,500
Hours Operated	69:54
Oil Used	8,980 gallons
Cost/gallon	8.807c
Btu/gallon	137,326
Btu/kwh	10,584
Lube Oil cost/gallon	68c
Fuel Cost	$790.85
Labor (Operating)	$ 53.25
Labor (Main.)	$168.89
Total Maintenance	$711.48
Operations Expense	$2,372.83
Total Production Ex. (Main. and Oper.)	$3,084.31
Fixed Charges (Rent)	$6,420.53
Total Production and Fixed Charges	$9,504.84
Fuel Cost/kwh	6.79 mills
Cost/million Btu	64.15c

At EEI Annual Sales Conference . . .

Industry Marketing Specialists Hear of New Successes, New Challenges in Advancing on "Total Electric Frontiers"

"Total Electric Frontiers" were subjected to intense exploration, again, in the 27th Annual Sales Conference of the Edison Electric Institute held Mar. 20-22—and the new challenges sighted were promising enough to stir the imagination of the most adventurous of the hundreds of electric power industry sales executives in attendance.

With cooperatively organized approaches functioning with dramatic effectiveness in residential, industrial and farm markets, still another key market—commercial construction and modernization—beckoned. And, a proposal to the industry that it mobilize its resources now to direct the Total Electric approach to the entire building construction industry came from one speaker, W. W. Sproul, Jr., vice-president of Westinghouse. He urged his industry colleagues to look at this sales target as "more than just a market . . . as a new frontier" and urged them to make it a "Total Electric Frontier."

EEI's Managing Director Edwin Vennard emphasized "one measure of the aggressiveness of our salesmanship—the amount of money we are spending per dollar of annual gross revenue for our sales effort." He advised: "I believe we can increase our sales expenditure to the amount we were spending in 1937—about 2.5-cents per dollar of operating revenue—always provided that we sell a balanced load at a proper price." And, Mr. Vennard added: "I believe you will find your Chief Executive willing to increase sales expenditures provided you show him how the increase expenditure can work to improve percent return."

W. M. Shepard, chairman of the Live Better Electrically policy committee reported that in 1961, featuring Live Better Electrically themes, manufacturers will invest over $20-million . . . to which the utilities will add $30.5-million in their own local efforts and our own efforts of $2.5-million . . . a total of more than $53-million.

Mr. Shepard presented a resume of the results of the motivation study of American householders conducted last year by LBE. He said these important things were learned:

1. Our ads must be believable, picture a believable mother using an electric appliance to benefit her family.

2. And the ads must draw a distinction between gas and electric appliances—giving the family a reason for buying electric over gas.

In his slide presentation, Mr. Shepard also advised: "Let's never forget *what we are selling* in our Gold Medallion Home advertising. First, foremost, and always we are selling a concept. We are selling the concept of a better way of life through total electric living . . . in a Gold Medallion Home. We sell this concept of total electric living in a believable and highly convincing way. We sell in our advertising —through actual families now enjoying the benefits of living in total electric homes."

Mr. Shepard reported on how local utilities have been using the Live Better Electrically promotion materials:

1. Seventy companies have purchased well over $100,000 worth of window banners and other point-of-sale materials.
2. Utilities have purchased over 60,000 reprints of Live Better Electrically ads for display in showrooms, offices, dealer meetings, and as mailing pieces.
3. Eighty-four utilities are using artwork from the Live Better Electrically ads for their own local ads, getting beautiful high-quality artwork and saving themselves the great expense of local photography or art.

Sherman R. Knapp, EEI president and president of Connecticut Light and Power Co., proposed that the sales departments of the shareholder electric utilities all across America could serve as an effective agency to get our story understood. Mr. Knapp said: "In spite of the fact that the electric industry stands much higher in public regard now than during the Thirties, it still has a long way to go. We have yet to attain public support and understanding which will make it possible to eliminate the gross inequalities that exist in our efforts to compete with subsidized government power. We need to increase our efforts particularly at the local level," he advised.

"Our sales people, selected and trained to sell our product, have done a good job. Without salesmanship, hard sell and soft sell, in person and in print, there would be a lot less water heaters, dryers, street lights, electric blankets, and TV sets in use. But have we trained them to sell our ideas and ideals? I wonder if we are using to the fullest this potent force for communicating to the public, not only our beliefs in our industry, but the facts of our national economy."

Industrial Division

George W. Jernstedt, manager of manufacturing planning, Westinghouse Electric Corp., urged utility sales people: "Be sure you are helping your customers in looking for new methods by which your customer can and must secure a continuous increase in productivity year after year by continually planning improved methods. You can step up the ladder by educating yourself to new techniques and by making sure that the improvements are progressive and fit into the future. Taking your customer to visit other related manufacturing organizations will aid in this education. Making contact with the local technical societies in your customer's individual field of effort will upgrade his performance and your knowledge."

Karl H. Rudolph, vice president for marketing of the Cleveland Electric Illuminating Co. discussed

"Measurement and the Industrial Manager." He proposed that "Every manager should adopt the philosophy that he can and should measure so the quality of management will keep pace with the future."

He cited these examples of measures which can be used:

1. Calls per day, 2. Expense per dollar of Earned Annual Revenue, 3. Miles per call, 4. Cost per call, 5. Earned Annual Revenue from lighting, and 6. Earned Annual Revenue per man per month.

"No one measure will give an adequate evaluation of performance," Mr. Randolph noted. "Taken together, however, such performance measures help tell the sales manager how he is doing."

F. F. Dickman, manager of industrial sales at West Penn Power Co., reported on activities with the Industrial Power Distribution Course which became available in February from the IEC. He said, "While we cannot measure what we accomplished in this area, we are confident that this activity will prevent many bottlenecks to load growth from appearing in our customers' plants. As a side benefit, our power sales engineers are better qualified to help their customers on power distribution problems. We are satisfied these courses were well worth conducting, and that classes of this kind are the most effective way to get customers to take the desired action in their own plants."

Skilled, energetic instructors and a select group of "students" can foster a great deal of awareness in electric comfort heating for industry, and bring about an awareness of the versatility of electric energy to solve any space conditioning requirement, according to J. C. Zeiler, systems supervisor, Commercial and Industrial Sales, Indiana & Michigan Electric Co., in his discussion of the IEC's 12-hour course in "Electric Comfort Heating For Industry."

"With the proper presentation," Mr. Zeiler stated, "the course should pay for itself a hundred-fold before the last of the six, two-hour sessions is conducted . . . and, even better, continue to make its benefits apparent in the years to come."

Residential Group

H. F. G. Main, chairman of the load research committee of the Association of Edison Illuminating Companies, and manager, business research of Potomac Electric Power Co., reported findings from the National Residential Lighting Survey—"the first time residential lighting has been completely separated from the rest of the home load and continuously metered for an entire year."

The survey pointed up that:

1. The annual average use per customer for lighting was 854 kwh and averaged 21.8 percent of the total electric usage. (If the 21.8 percent lighting segment is assumed to be the basic non-competitive load in the home and uses the initial blocks of the rate structure, it can be shown that lighting contributes about 35 percent of the utilities' residential revenue.)

2. The group load factor is 35 percent for the two-week test period, December 22 to January 4. The annual group load factor for lighting (based on group average weekday maximum demands) is somewhat less than 20 percent and shows some improvement as annual lighting use increases.

3. Summer demands were substantially less than those in winter, indicating that lighting is an attractive load in areas where air conditioning in summer is producing class and system loads. Lighting's annual demand of 47 percent, that is—ratio of demand to connected load, indicates a high degree of diversity in the use of individual lamps and fixtures in a dwelling.

Under the project, Middle West Service Company cooperated with 22 utilities to secure metered test data from 124 homes located all over the country—from coast to coast, and the Load Research Committee of the Association of Edison Illuminating Companies undertook the analysis of the data.

C. W. Mills, manager for market development of the Westinghouse apparatus marketing division, said

Accepting industry awards for sales promotion activities in the field of commercial sales were (l. to r.) Luther T. Cale, Alabama Power Co.; James M. Williams, Central Power & Light Co. (Texas); Al Wade, Connecticut Light and Power Co.; L. B. Reslen, Ohio Power Co.; and Norman W. Foy, Jersey Central Power & Light Co.

Industry Oscars Presented

Sixteen awards for outstanding efforts in sales promotion activities were presented to 13 electric utility companies by Mr. A. M. Wade, vice president—sales, the Connecticut Light & Power Co., and chairman of the EEI Awards Committee. The 13 companies that received handsome plaques for 1960 sales promotion activities were: Duke Power Co., Pacific Gas and Electric Co., Indiana & Michigan Electric Co., Florida Power Corp., Ohio Power Co., Alabama Power Co., Central Power and Light Co. (Texas), Jersey Central Power & Light Co., Wisconsin Power & Light Co., The Dayton Power & Light Co., Ohio Edison Co., West Penn Power Co., and the Toledo Edison Co.

Sales Conference—*Cont.*

"The key to the question Why Total Electric, lies in the practical flexibility which we, and we alone, can offer today's home. This is the flexibility which we build into the services which we can provide, services which will give the American family the glamorous, sophisticated new way of life which it is looking for.

"Second, this glamorous Total Electric Concept requires down-to-earth selling, selling which musters the enthusiastic energies of everyone in our organization, and everyone in your organization.

"Third, you hold the key to orienting your company's image to the public's concept of modernity so necessary to selling the Total Electric Gold Medallion Home. You can initiate right now modern-looking monthly statements, trademarks, stationery, and company identifications, and enthusiastic employee training programs. Remember, the public's total impression of your company will have an important effect on your success with the Total Electric Gold Medallion Home."

Discussing Marina City, Chicago's twin 60 story apartment towers, which will be Total Electric, L. E. Pierron, commercial manager for Commonwealth Edison Co., said that "The fact that Marina is all-electric resulted from total team report. We were early birds. We organized a sales and engineering team, and we took full advantage of industry know-how."

Farm Group

According to Charles A. Snavely, executive vice president of the Illinois Retail Farm Equipment Association, in discussing the New Revolution in Farming, "Statistics show that farmers handle many millions of tons a year—a real challenge to your industry, the power supplier for much of it, but much of it requiring top grade engineering."

He concluded, "A little encouragement from you power men. A little offer of aid. Maybe a tip of some interested farmer that you have heard about. An offer to assist in the over-all engineering project. Any of these things may well be the answer to getting more really qualified dealers into the field. And to you, this is the answer. You want to sell electricity. This materials handling field, this business of systems . . . it's unlimited."

Suggestions toward how utilities and manufacturers and their dealers can build sales together were made by V. L. Schreiber, product development manager for the New Holland Machine Co. He proposed:

1. Sharing Research and Development Ideas
2. Exchange of Related Information
3. Joint Conferences
4. Exchange of Promotional Materials
5. Benefit from Each Other's Sales Promotions
6. Develop Better Understanding of Electrical Terms and Devices
7. Use of Testimonials
8. Management Should Be Kept Well Informed.

"You will sell power only as long as that man to whom you are selling is making a profit and can afford to pay his bills. Therefore it behooves each of us to have an interchange of information that will help develop an understanding that will best serve this farmer," Mr. Schreiber declared.

Ernest E. Porter, vice president and business manager for Home State Farm Publications told the group to build up ideas and schemes to give farm power sales representatives additional incentives to get out and sell and an excuse to call more often on farm families.

"The more ideas you, your suppliers, and your industry have to put the spotlight on the values of the use of electrical equipment," he concluded, "the closer you will come to the ideal 'complete acceptance' of the advantages and Better Farming efficiency of your kind of product."

Commercial Group

Commercial electric cooking has grown up in the last decade, from a total national load of about 1-million kw in 1950 to more than 9.5-million kw in 1960, according to Murray Joslin, vice president in charge of sales for Commonwealth Edison Co. This represented annual revenue to the utilities of about $228-million, he observed.

In 1956, Commonwealth Edison found themselves ranking 47th nationally in sales of commercial cooking load. They decided then that an intensified effort had to be exerted to improve their standing.

Said Mr. Joslin, "From slightly over 3000 kw added the first year (1956), our sales grew to over 31,000 kw in 1960. Our total new payload of over 100,000 kw installed in the last four years is now returning an estimated annual revenue of over $2,300,000."

This increase has resulted from a sales program incorporating 10 major areas, which Mr. Joslin summarized as follows:

1. Support of top management
2. Know your equipment
3. Sales Training
4. Demonstrations
5. Contests
6. Sustained Programs
7. Sales Presentations
8. Food Service Fairs
9. Follow-up
10. Advertising

"Our promotion of Flameless Commercial Cooking Equipment is most encouraging," Mr. Joslin continued. "From our operating and revenue points of view we find the cooking load is diversified and profitable and we will continue to sell it for every possible application. In *your* sales programs you must decide *how much* of the market you want, then make your plans and go out and get it."

Describing the Keep Pace Electrically program, John F. Biggi, manager of the National Wiring Bureau, and Porter Henry, Jr., president of Porter Henry & Co. said last year was a year when "more individual electrical contractors, contractor associations, leagues and power companies evidenced interest and participated in the use of the commercial program than heretofore."

In picturing what the year ahead holds they said, "It's going to be a year when a new enlarged space advertising campaign will carry the recognition of the Keep Pace Electrically emblem to 1.5-million businessmen. It will be a year in which a spanking-new commercial wiring profits workshop becomes available for you to use with electrical contractors."

MANUFACTURERS-PRODUCTS

Huge A-C Autotransformer

This is the first of two load-tap-changing autotransformers being furnish the Power Authority of the State of New York for their Niagara switchyard. The 345/230-kv, 400-mva transformer weighs 730,000 lb and is the largest (in physical size) ever built by Allis-Chalmers.

Class H Insulation Tested

The fire-resistant quality of inorganic Class-H transformer insulation was recently demonstrated in a unique test. A 1000-kva open dry-type transformer built by General Electric sat for six hours in the midst of a "total loss" truck fire without burning.

The transformer was being shipped by truck when a tire caught fire and spread to the truck trailer, igniting highly combustible materials loaded with the unit. In just minutes the truck body and the combustible materials were completely destroyed.

But the transformer, although subjected to intense heat which buckled steel panels housing the core-and-coil structure, did not catch fire.

Without any repairs, the transformer was subjected to and passed standard high potential and induced voltage tests. The inorganic Class H insulation system had not only demonstrated the safety of its fire-resistant quality, but had resisted serious damage in the face of the intense heat.

New RFI Filters

A solution to the growing problem of radio-frequency interference (RFI) from high-power microwave transmitters, has been developed by General Electric's Power Tube Department.

Scientists and engineers at the department's Traveling-Wave Tube Product Section, Palo Alto, Calif., have perfected a technique for making waveguide power filters which effectively eliminate RFI caused by harmonics, Dr. C. G. Lob, manager of the section, revealed recently.

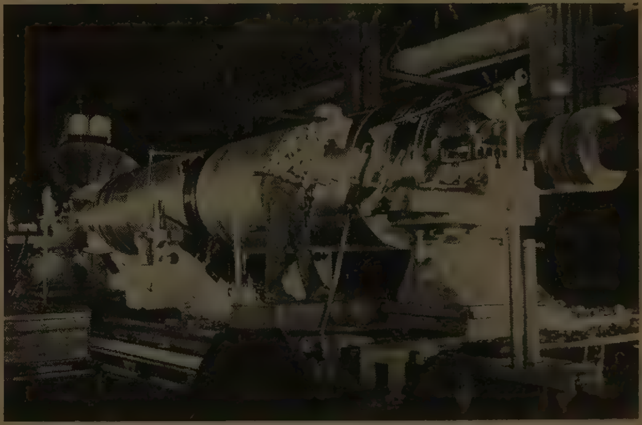
Working on a principle analogous to that of the common automobile muffler, the new filters absorb the unwanted harmonic signals produced by all transmitting tubes, but still allow the intended fundamental frequency to pass through with its power undiminished.

Designed primarily for use in high-power transmitters, the harmonic absorption filters operate in frequency ranges from 400 to 6000 mc. G-E also revealed that other types now in advanced development operate up to 10,000 mc and that the technology developed during the past five years makes it feasible to design filters to meet needs as high as 40,000 mc.

In addition to the main function of eliminating RFI caused by harmonics, the filter serves to increase the power-handling capability of the waveguide system by eliminating waveguide arcing which results from harmonics.

The filter itself is constructed and installed so that apertures are positioned along the inside walls of the main waveguide.

Massive Generator Rotor



This 228,870-lb generator rotor is being machined on a 120-in. lathe at U. S. Steel's Homestead District Works. The rotor is almost 35-ft long with a 59½-in. diameter for 20 ft of the length. Produced for General Electric, the rotor was forged and machined from a 110-in. diameter ingot of nickel-molybdenum-vanadium steel. The ingot was vacuum cast in an electric furnace at the U.S.S. Duquesne Works.

Aluminum Switch Has 3-in. Bolt Circles

Aluminum switch, Type TTR-6 by I-T-E Circuit Breaker Co., features new high-strength 3-in. bolt circle insulators for 450, 550, 650 and 750 kv BIL ratings. New materials and techniques result in 45-percent weight reduction. Including 161 kv, the units are operated with manual, torsional mechanisms. Three single poles, fully assembled, are shipped in one crate, fully adjusted and ready for installation. Insulators are new I-T-E dark blue-glaze, high-strength alumina porcelain units assembled in stack for 450, 550, 650 and 750 kv BIL ratings. Silver-to-copper contacts have been retained as a major feature of jaw and hinge construction in the new current carrying parts. Bases are welded aluminum alloy extrusions, forming a rigid, box-girder type of support for the various insulator stacks. Four full-size single pole switches have been shown throughout the country.

For more data, mark #1 on reply card.

Remote Alarm Indicator

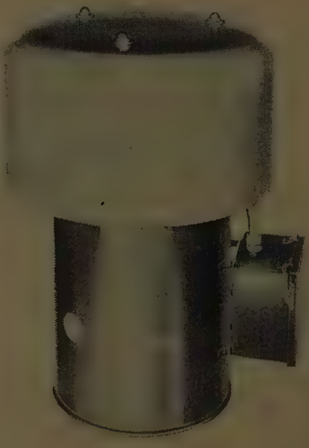
Remote alarm indicator line by Motorola, Inc., now includes units for mounting at utility pole bases. New model consists of a 25-watt radio transmitter and a tone coding device, mounted in a pressurized transformer tank for all-weather operation. Tank is covered by a steel hood to prevent tampering. A total of 290 remote alarm indicators can be included in a single system.

For more data, mark #2 on reply card.

Epoxiglas Ladders

Maintenance ladders by A. B. Chance Co. with Epoxiglas rungs and side rails are equipped with hooks, safety chains and snaps so that they can be used for all types of line and station maintenance, either on cold or energized circuits. The high insulation level of Epoxiglas permits them to be used safely. They require no special maintenance or drying. In lengths from 8 to 20 ft.

For more data, mark #3 on reply card.



Voltage Comparator

Frequency-insensitive voltag comparator by Allis-Chalmers designed to keep a voltage regul tor accurately informed regardle of frequency. It uses a bridge ci cuit of zener diodes and resisto together with magnetic amplifier Particularly effective for hydr electric installations since wat control valves cannot close quick enough to compensate for turbi overspeeding.

For more data, mark #4 on reply card.

Porcelain Spreader

A "one piece" porcelain spreade for spacer type aerial constructio by Fargo Mfg. Co., Inc. has a uni versal or swivel type mechanica connection at the neutral whic provides permanent positioning o the "S-2." Designed for complet hot stick installations at either 5 o 15 kv. Conductors are firmly an easily attached with rigid poly vinyl chloride factory formed ti rods. Impulse, flashover and RI tests are comparable with other 15 kv equipment. Minimum dea weight rating of the porcelain i 2500 lbs.

For more data, mark #5 on reply card.

Improved Distribution Arrester

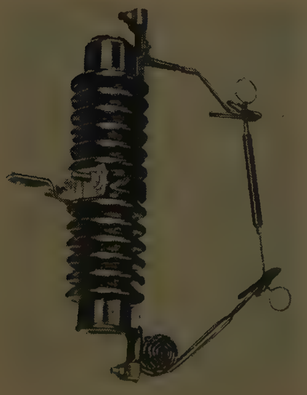
Improved arrester (3 to 27 kv) from Westinghouse Electric Corp. reduces impulse sparkover and discharge voltage characteristics as well as size and weight by 20 percent. Nonexplosive dropout prevents line lockout in event of a damaged arrester. Power follow current not valved off in ½ cycle after stroke discharge actuates a thermal element in the dropout device to separate the ground stud from the arrester body.

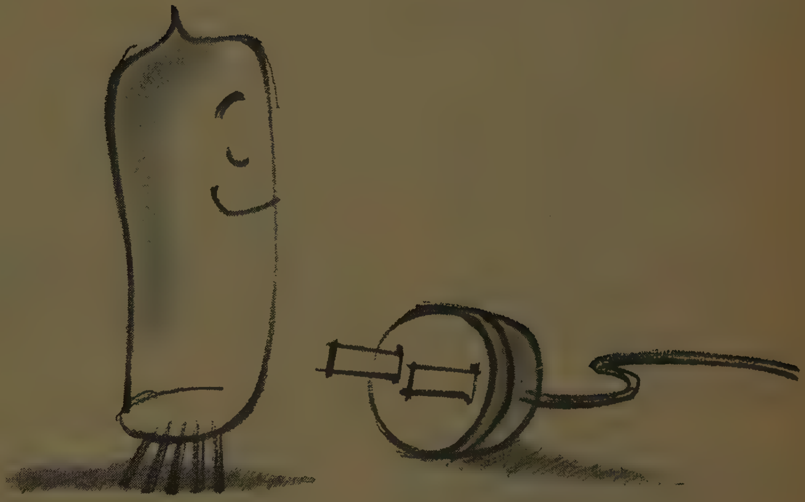
Circle item #6 on reply card

Flip-Out Cutout

Flip-out cutout by Hubbard and Co. for protection of lines with low available short circuit currents is available in 7.8 and 15 kv ratings. Sure grip contact arms prevent fuse link ends from falling to the ground after interruption. This minimizes fire hazard and assures easy identification of the fuse link. Double forked contact arms afford simple fusing from either side. Units are bird-proofed.

Circle item #7 on reply card





"being electrical's all right

— but *I'm* electronic"

Specialization is a great thing to get the right talents where they can do the most good. It's a good thing some people want to be mayors and some others would just as soon collect garbage.

But pride in your specialty can go to amusing extremes sometimes — like people in the "New Frontier" industries convincing themselves that their plateau is a little higher than anyone else's. Maybe it's only because there's more initial glamor associated with the new problems than the old familiar ones.

The E.E.'s at Fisher-Pierce work on both "electrical" and "electronic" jobs for every utility customer we have. They seem to rationalize things on the basis of whether it's milliwatts or kilowatts, Ohm's Law and plain figgerin' still pull out the answers. Got any hot new problems you'd like us to work on (electrical or that other kind)? Fisher-Pierce Division, Sigma Instruments, Inc., 81 Pearl St., So. Braintree 85, Massachusetts.

FP

FISHER PIERCE

CHECK VIBRATIONS OF
overhead
TRANSMISSION LINES
with
"JAQUET"
VIBRATION COUNTER
No. 514
Frequency Range 5-100 CPS
Registers up to
100 million vibrations
Write for Bulletin 1061
HERMAN H. STICHT CO., INC.
27 PARK PLACE, NEW YORK 7, N. Y.

Four Fine Facilities
in PITTSBURGH

ALLEGHENY MOTOR INN Opposite Greater Pittsburgh Airport. 60 air-conditioned rooms, tile bath, TV, radio, phone. Superb restaurant and cocktail lounge. Year-round swimming pool. Courtesy car to and from airport. AMherst 4-7700

HOTEL PITTSBURGHER In the heart of the Golden Triangle. 400 outside rooms, bath, TV, radio, air-conditioning. General Forbes Lounge & Dining Room. ATlantic 1-6970

JACKTOWN MOTOR HOTEL 1 mile west of Irwin Interchange on Route 30. 60 air-conditioned rooms, TV, telephone, combination tile bath. Facilities for dining and group parties. UNderhill 3-2100

HOTEL PITTSBURGHER MOTEL Opposite Greater Pittsburgh Airport. 56 air-conditioned rooms, tile bath, radio, TV, phone. Courtesy car to and from airport. AMherst 4-5152

KNOTT K HOTELS
*Teletype Service. Telephone any Knott-Hotel. All Knott Hotels and offices in U.S. connected by teletype.
Joseph F. Duddy General Manager

ELECTRICAL POWER BY DC POWER SPECIALISTS

Mathematical Design from Scripta Mathematica

RECTIFIER QUALITY
Quality is a big word at RAPID ELECTRIC

From engineering design and development to final production and shipment RAPID maintains strict control over its high quality.
(1) NEMA standards strictly maintained.
(2) Transformers, reactors, magnetic amplifiers, meter shunts, and selenium stacks designed and produced by RAPID, insures quality control.
(3) Years of skillful engineering, production methods and test facilities assure rigid high quality standards will be upheld.
Regardless of application, RAPID is interested in your dc power requirements. Why not send your inquiry in today? Write or call TA 8-2200.
Catalog and descriptive brochures available upon request.

RAPID ELECTRIC CO., INC.
2881 MIDDLETOWN ROAD • NEW YORK 61, N.Y. • TAlmadge 8-2200
PLANTS: (4) NEW YORK, N.Y. • GRAYSBRIDGE ROAD, BROOKFIELD, CONN.

H-V Horizontal Line Posts

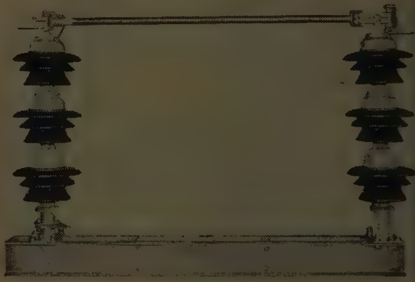
High-voltage horizontal mounting Line Post insulators for armless transmission contruction at 115 and 138 kv are announced by Lapp Insulator Co., Inc. Units of two strength classes are available, each in three lengths, which match (and in some important characteristics, exceed) flashover values for strings of 6, 7 and 8 standard suspension insulators.

Circle item #8 on reply card

Side Break Switch

New high capacity ratings have been developed for Royal Electric Mfg. Co.'s Type RSL side break switch. Type RSL, incorporating braidless design, has recently been tested at short circuits of more than 70,000 amps at 115 kv. Available in 600 amp, 40,000 amp momentary ratings, and 1200 amps, 61,000 amp momentary ratings from 7.5 through 161 kv.

Circle item #9 on reply card



ELECTRICAL DISTRIBUTION ENGINEER

The Department of Public Utilities of the City of Norwich, Connecticut has an opening for an Electrical Distribution Engineer. Permanent employment with an opportunity for advancement to the position of Electrical Distribution Superintendent. Minimum requirement B.S. Degree in Electrical Engineering supplemented by at least six (6) years' experience, four (4) of which must have been in the Electrical Distribution Field. Starting salary $7,103.00 a year, progressing to $8,223.00 a year. Write to Department of Personnel, City Hall, Norwich, Connecticut, for application blank.

RG&E Creates . . .

(Continued from page 51)

has automatic temperature control.

Because of the availability of ample system steam capacity, and freedom from noise and vibration, an absorption-type refrigeration plant was installed. This is located on the building's penthouse thus resulting in minimum condenser-water and chilled-water piping and pumping costs. It will serve the entire building.

A high-pressure dual-duct system takes care of excessive heat in internal areas. This has individual mixing boxes for each office or zone, and diffusers located level with the bottom of the ceiling. High and low returns take air back to the apparatus room where it can be re-used or exhausted to the outside as conditions require.

Objectives

In addition to company benefits derived from stepped-up working efficiency, RG&E officials expect that their "Space Conditioning" program will create a reference laboratory for utility sales, demonstrating that modernization of existing commercial and industrial structures is practical, desirable, and economically sound. The program, thus, is expected to give added impetus to Rochester's urban renewal.

Costs

Total cost of the integrated lighting-heating-air conditioning system in the 150,000 square-foot structure will be about $1.5 million. This involves $600,000, or $4/sq ft, for lighting and $900,000, or $6/sq ft for air conditioning and heating. Going to the 200-footcandle level will cost much less than expected, according to one company spokesman, and nowhere near double the cost that would have been entailed by installing a 100-footcandle system, the bare minimum recommended by I. E. S. for general office work.

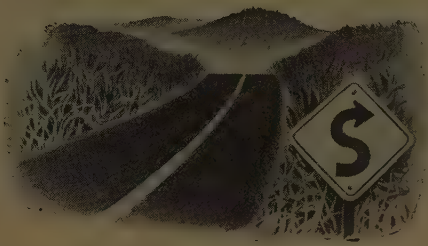
General Electric Company illuminating engineers and Consulting Engineer Pat Cherne are collaborating with RG&E engineers on the "integrated environment" adventure.

AMCHEM, the makers of **Weedone,** can solve your brush problem...*whatever it is*

LINE CLEARANCE

Turn brush-choked utility rights-of-way into brush-free areas quickly and economically with WEEDONE/WEEDAR brush control chemicals. Also now available—complete brush control programs through new "dormant cane broadcast spraying" techniques.

ROADSIDE CLEARANCE



New AMIZINE Weed Killers and AMIZOL combinations provide complete vegetation control along thousands of miles of roadsides, center strips, embankments, guard rails, etc.

RIGHT-OF-WAY CLEARANCE

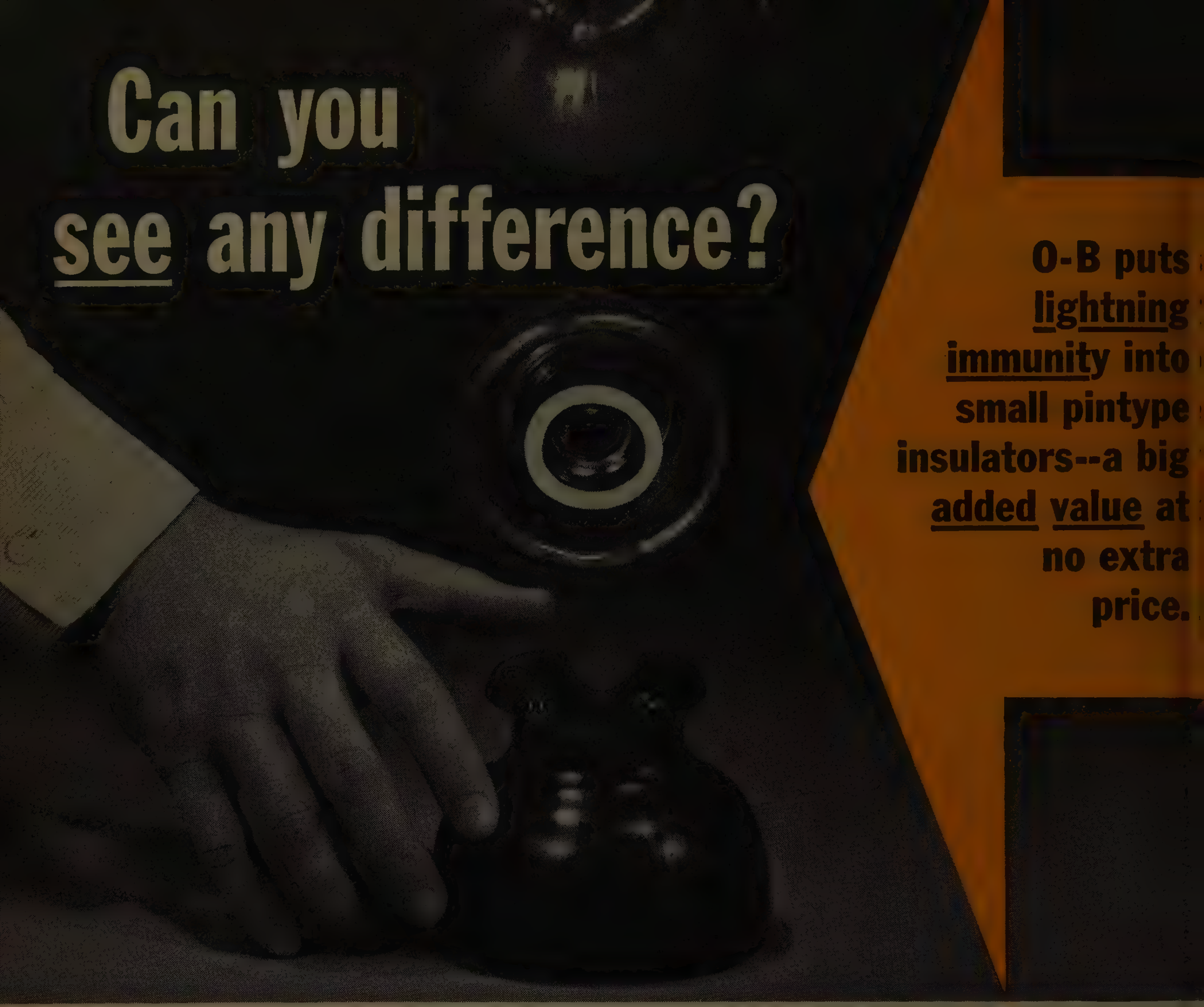
Specialized Amchem techniques using WEEDONE/WEEDAR chemicals and AMIZINE/AMIZOL combinations provide high control, low cost chemical brush eradication programs for railroads.

AMCHEM **AMCHEM PRODUCTS, INC.**

Amchem, Weedone, Weedar and Amizol are registered trademarks of
AMCHEM PRODUCTS, INC. (Formerly American Chemical Paint Co.)
AMBLER, PA. • Niles, Calif. • St. Joseph, Mo.

AMCHEM PRODUCTS, INC., Ambler, Pa.
Please send me copies of your "Brush Control" brochure and full information on the uses of Weedone Brush Killers.

Name________________ Title__________
Company____________________
Address____________________
City__________ Zone_____ State______



Is this just like any other pintype insulator you buy? Does it look the same? Chances are it does.

Take another look. See the scars on the porcelain? These are from repeated electrical discharges many times as severe and destructive as natural lightning. O-B has one of the very few laboratories in the world that can *produce* such a discharge - - and, to our knowledge, the only low voltage pintype that can *take it.*

The combination of unexcelled technical facilities, and a desire to apply these to the development of a low-cost insulator, are unique in the electrical field. The difference isn't in shape, or size, or even price - - the difference is in performance, and in saving the high expense of detection and replacement of lightning-damaged insulators.

Because they seldom have shielding, distribution lines have high exposure to lightning attack. This can't be cured by an insulator, but it can be combated. This is the big extra you get when your lines are insulated with O-B. They don't puncture. They truly do save you money because of this - - a lot of it!

O-B pintypes are as handy to you as your telephone. Graybar can deliver them to your door today if you need them that quickly.

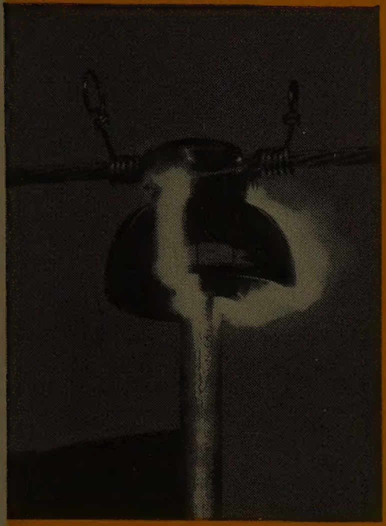
OHIO BRASS COMPANY, MANSFIELD, OHIO

Ohio Brass

HOLAN

10131-H

Graybar Quality Since 1869 Reg. U.S. Pat. Off.
Distributed by Graybar Electric Company



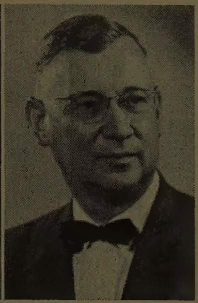
Far more wicked than natural lightning - - this O-B distribution pintype is withstanding an impulse discharge having the phenomenal wave front of 8,000,000 volts per microsecond. Destructiveness of this discharge is many times what can be encountered in service. It will shatter the average insulator but in the case of O-B, it can be applied repeatedly without harm. The insulator on the opposite page shows the result of this extremely severe test. The glaze has been burned by the great heat in the flash, even though its duration was only in the order of 8/100 of one millionth of a second. Otherwise the insulator is perfectly sound. Its full useful life has not been impaired.

When you buy distribution insulators remember what you have just seen. You are also buying the ability of the manufacturer to reproduce the basic design faithfully in large quantities over long periods of time. And you pay nothing extra for this protection to your service.

MEN OF POWER

Frank V. Smith, left, partner and general manager of Sargent & Lundy, has been named senior partner succeeding **Alf Kolflat,** right, who retired March 31. Mr. Smith joined the firm in 1927 and was admitted to partnership in 1945. The following year he was appointed chief electrical engineer, a position he held until becoming general manager in 1954. Mr. Kolflat became a member of the firm in 1938 and served as senior partner since 1954.

Smith



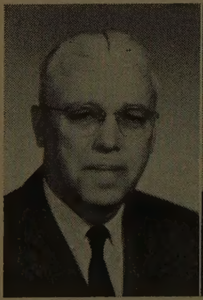
Kolflat

* * *

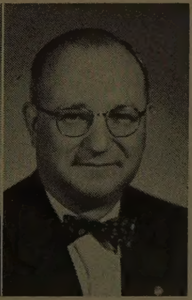
C. A. Thrasher, superintendent of electric and steam sales in Ohio Edison's Akron division, has been named manager of the company's Springfield division to succeed **H. E. Miller** upon his retirement next July 1. **R. G. Zimmerman,** superintendent of electric and steam sales in Youngstown, will take over Mr. Thrasher's former post. In turn, **H. W. Miller** will fill Mr. Zimmerman's post and **P. R. Wetherstein** will take over Mr. Miller's former assignment as industrial sales supervisor at Youngstown.

* * *

W. W. Babcock, left, vice president — public relations of Central Illinois Light Company, has been elected chairman of the board and **G. W. Hathway,** right, executive vice president, has been elected president of the company. Elections by the board were to fill vacancies created by the retirement of **E. D. Edwards** who held both posts. Both of the officials are veterans with CILCO, with 30 and 29 years service respectively.



Babcock

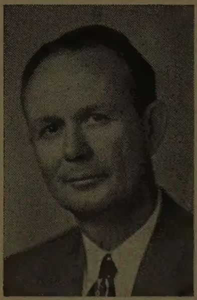


Hathway

* * *

E. M. Simpson, secretary and assistant treasurer of South Carolina Electric and Gas Company, has been elected secretary-treasurer of Virginia Nuclear Power Associates, a group of four Carolinas and Virginia utilities now building the Southeast's first atomic power plant.

* * *



Llewellyn

M. R. Llewellyn, manager of Arizona Public Service Company's gas and electric operations, was elected a vice president last month by the company's board of directors. He will continue to manage his present area of operations. He joined the predecessor Arizona Edison in 1947 as general superintendent of operating and engineering following service as an engineer with a California utility.

* * *

P. G. Ellis, assistant to the president, has been elected vice president — division operations of the Wisconsin Public Service Corporation succeeding **H. I. Miller** who retired in February. **D. W. Faber,** secretary, and **L. G. Roemer,** treasurer and director, were also elevated to vice presidencies by the same board action.

* * *

J. A. Tillinghast, staff engineer of the American Electric Power Service Corporation, has been appointed project engineer of the newly-announced 580,000-kw Unit 4 at the Tanners Creek Plant of Indiana & Michigan Electric Company. He will coordinate planning, design, construction and initial operation activities of the Service Corp.

NEW SANGAMO STACK RACK CAPACITOR EQUIPMENTS

put more kilovars in less space

Here's the newest Sangamo development in capacitor stacking units . . . designed around the smaller and lighter Sangamo 50 kvar and 100 kvar capacitors. You get more kilovars in a given amount of space. For example, the new Sangamo stacking units with 100 kvar capacitors provide twice as many kvar as previous equipments, yet have the same length and height dimensions, and are only 12 inches wider.

There's a big weight reduction, too. Equipment weights with 50 kvar units are down 20 percent or more—those with 100 kvar units, down 25 percent or more.

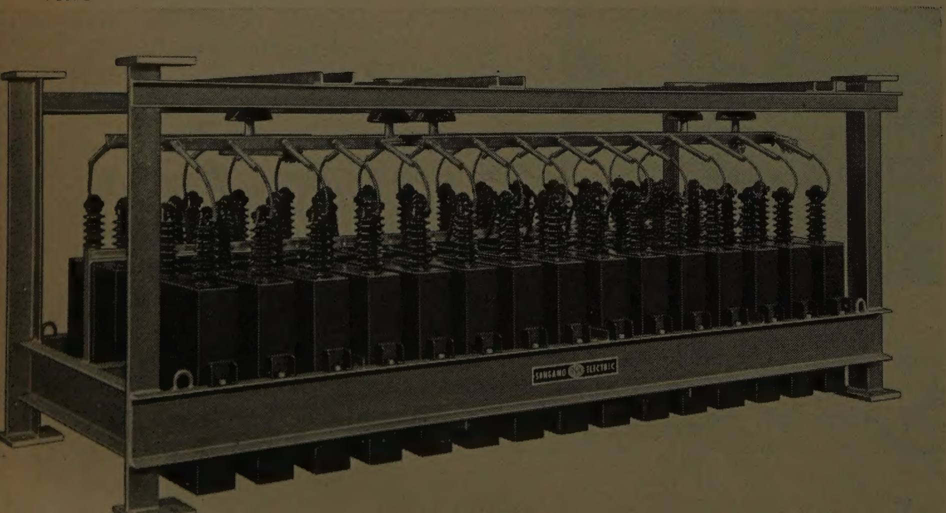
You'll save money, time, and substation space by stacking your kilovars with Sangamo stacking units. Compact and light, they permit better use of premium space, require minimum footing, and are easier to mount. Need less maintenance, too, because of stainless steel capacitor cases, all-welded aluminum rack construction, high structural strength, and non-ferrous fittings.

Remember, Sangamo equipments with 100 kvar units make it possible to use one rack where two were formerly required. This is especially important in 3-phase packaged substation equipments, and in some instances on large, high voltage stack rack installations.

Write us for further information.

SANGAMO ELECTRIC COMPANY
SPRINGFIELD, ILLINOIS

PC61-2



Men of Power Briefs

W. L. Mingledorff, Jr., former mayor of Savannah, has been appointed assistant to the president of Savannah Electric & Power Company.

D. J. Coughlin is The Brewer-Titchener Corporation's new general sales manager. He succeeds **F. A. Celler** who resigned recently.

A. W. Scheib, Lincoln District engineer for West Penn Power Company, has been named assistant to the vice president—division operations.

P. A. Stover, formerly chief mechanical engineer of Iowa Electric Light and Power Company, has been named director of purchasing and stores. **Marvin Wright,** former purchasing agent, has retired.

D. A. Pritchard, with the Lamp Division since 1942, is now manager of sales for General Electric's Wire and Cable Department.

L. J. Gross, vice president and treasurer of Combustion Engineering, Inc., has been named vice president-finance.

REGULATORY REVIEW

(Continued from page 41)

"It is impossible to discuss this problem in any detail in a Commission Order. Suffice it to say, by way of summary, that increasing debt is bound to increase risk and that the weighing of the many imponderables in this area can and must be done by the management. Different utilities have different problems, both internal and external, and arbitrary action on the part of this or any other commission enforcing this Petitioner and all other utilities under our jurisdiction into a specific financial straight jacket would create a dangerous situation which inevitably would backfire with tragic consequences not only to the utility but to those whom it serves."

There is no question that the Commission's position in this respect is eminently sound, since only too frequently those who play the role of the public protector propound policies which in the fina analysis are against the public interest.

Rates to Rural Co-ops

In the proposed distribution of the rate increase, the petitioner specifi ally asked the Commission's per- nission to exempt the rural co-ops. The order noted that:

> **"Much of the record in this case is levoted to the status of the Rural lectric Membership Corporations. etitioner proposes no increase to the EMC's. In justification of this posiion, petitioner states that imposing n increase on the REMC's would inrease the likelihood that a loan would e made to the REMC's by the Rural lectrification for the purpose of contructing generating facilities. If such plant were constructed, more than 1,000,000.00 of net operating income vould be lost to Petitioner. Also, their ontribution to expense of Petitioner vould have to be absorbed by the rate ayers. The Public Counselor and the ntervening Cities argue that Petiioner is trying to force domestic cusomers to subsidize the REMC's."**

The Commission noted that since he Company is not seeking to raise he rates to the Co-ops, it has not ntroduced any evidence in support f such as increase. It would appear o be somewhat contradictory thereore for the Commission's Order o note that:

> **"Petitioner's Exhibit No. 14 does et out the rate of return based on net riginal cost and reproduction cost lepreciated which is currently appliable to the different classes of servce.** *This exhibit does illustrate that oth the REMC classification and ublic Street and Highway Lighting lassifications are returning a lower ate of return than is the Domestic lassification.** **It also might be pointed ut that Municipal Sales return the ext highest rate of return, but that he rate of return applicable to this lass of service falls short of three ther classifications: to wit—Commerial General, Commercial Power, and ther Sales to Public Authorities. Using this exhibit as a reason for an pward adjustment of REMC rates vould logically require a similar adustment to Public Street and Highvay Lighting. None of the parties has uggested that the Commission do hat. "It is therefore the finding of this Commission that there is insufficient vidence in this record to require it r justify it in making any upward djustment of the REMC rates at this ime."**

This is an interesting example of ow utilities are not only regulated y their State Commissions, but also y the threat of ruinous competition rom tax exempt co-ops.

---

* Italics supplied

SANGAMO POLE-TYPE CAPACITOR EQUIPMENTS

Now, Sangamo pole-type capacitor equipments let you pack more kilovars into existing pole space. These new, all-welded aluminum rack equipments are more compact and weigh less because they are designed around Sangamo's smaller and lighter 50 kvar and 100 kvar capacitors. For example, the length of a 12-unit, 600 kvar rack with 50 kvar units has been cut by two feet, while its weight has been reduced by 20 percent over previous models. Still greater weight and length improvement is obtained with 100 kvar units. Reduced length and lower weight minimize both twisting and bending moment—make installation easier and lower in cost.

Sangamo pole-type equipments are available as both in-line and cluster mounts. Standard equipments with 50 kvar capacitors can carry up to 900 kvar in both types. Standard equipments with 100 kvar capacitors can carry up to 1200 kvar with the in-line rack; up to 1800 kvar with the cluster mount.

The in-line type has front-of-pole bracing to provide maximum climbing space free of grounds. 5 KV insulated stranded cable is used for unit and switch connections. Unswitched equipments have provisions for future addition of switches. All-welded aluminum racks, non-ferrous hardware and stainless steel capacitor cases keep maintenance costs down.

Write us for further information.

SANGAMO ELECTRIC COMPANY
SPRINGFIELD, ILLINOIS

PC61-1

CALENDAR OF EVENTS

April 27-28—Pacific Coast Electrical Association, Administrative Services Section, Villa Hotel, San Francisco, Calif.

April 30-May 6—Direct-Motivating Seminar (Unit II).

April 29-May 3—53rd Annual Convention of the National Association of Electrical Distributors, Cobo Hall, Detroit, Mich.

May 1—Interstate Power Club, Beverly Hotel, New York, N. Y.

May 1-3—Joint Rural Electrification and Appliance Conference, Kentucky Hotel, Louisville, Ky.

May 2-4—American Society of Training Directors, Inc., 17th Annual Conference, Bellevue-Stratford Hotel, Philadelphia, Pa.

May 8-10—Instrument Society of America, 4th National ISA Power Instrumentation Symposium, LaSalle Hotel, Chicago, Ill.

May 11-13—Pennsylvania Electric Association, Industrial Sales Conference, Skytop Club, Skytop, Pa.

May 15-17—EEI Purchasing & Stores Committee Meeting, Shamrock-Hilton Hotel, Houston, Texas.

May 16-18 and May 23-25—Line Material Industries, Distribution Systems Seminars, Thomas A. Edison Laboratories, Franksville, Wisc.

May 16-18—7th Annual National Right-Of-Way Seminar, Olympic Hotel, Seattle, Wash.

May 17-19—4th Annual Street Lighting Maintenance Forum, Holiday Inn Motel, Muncie, Ind.

May 17-19—Pacific Coast Electric Association, Annual Convention, Sheraton-Palace Hotel, San Francisco, Calif.

May 18-19—EEI Transmission & Distribution Committee, Netherland Hilton Hotel, Cincinnati, Ohio.

May 18-19—Pennsylvania Electric Association, System Operating Committee, Sky Top Lodge, Skytop, Pa.

May 22-24—American Institute of Electrical Engineers, American Rocket Society, Institute of Radio Engineers, Institute of Aerospace Sciences, and Instrument Society of America, National Telemetering Conference, Sheraton Towers Hotel, Chicago, Ill.

May 26—Pennsylvania Electric Association, Relay Committee Meeting, Sky Top Lodge, Skytop, Pa.

June 5-7—EEI Annual Convention, Waldorf Astoria, New York, N. Y.

June 11-13—Wisconsin Utilities Association, Accounting Section Conference, Dell View Hotel, Lake Delton, Wis.

June 13-14—National Safety Council, Public Utilities Section, Executive Committee, Laurentien Hotel, Montreal, Quebec, Can.

June 21-23 — National Committee on Utility Radios, The Nationwide Inn, Columbus, Ohio.

June 28-30—American Institute of Electrical Engineers, Instrument Society of America, American Institute of Chemical Engineers, American Society of Mechanical Engineers, Institute of Radio Engineers, Second Joint Automatic Control Conference, University of Colorado, Boulder, Colo.

INDEX TO ADVERTISERS AND THEIR AGENCIES

Allis-Chalmers Mfg. Co., Power Equipment Div.....Inside Front Cover, 31
Klau-Van Pietersom-Dunlap, Inc.

Amchem Products, Inc.....63
Al Paul Lefton Co., Inc.

Anaconda Wire & Cable Co.....22
G. M. Basford Co.

Burndy Corp.....6
Ted Gravenson, Inc.

Chance Co., A. B.....26, 27
Arthur R. Mogge, Inc.

Chevrolet Div., General Motors Corp.....24, 25
Campbell-Ewald Co.

Copperweld Steel Co., Wire & Cable Div.....Outside Back Cover
Reuter & Bragdon, Inc.

Dow Corning Corp.....19
Church & Guisewite Advg., Inc.

Duncan Electric Co., Inc.....Inside Back Cover
Armstrong Advg. Agency, Inc.

Fanner Mfg. Co.....36
Palm & Patterson, Inc.

Fisher-Pierce Div., Sigma Industries, Inc.....61
Culver Advg., Inc.

General Electric Co., Schenectady....23
George R. Nelson, Inc.

Hotel Pittsburgher....62
Bachman, Kelly & Trautman, Inc.

Kearney Corp., James R.....35
Lynch & Hart Advg. Co.

Moloney Electric Co.....32, 33
Hebert Advg. Co., Inc.

Ohio Brass Co.....30, 64, 65
Howard Swink Advg. Agency, Inc.

Rapid Electric Co., Inc.....62
The Mel Hammond Co., Inc.

Rome Cable Div., Aluminum Co. of America....11
The Rumrill Co., Inc.

Sangamo Electric Co.....66, 67
Arthur R. Mogge, Inc.

Shell Oil Co.....14
Ogilvy, Benson & Mather, Inc.

Sticht Co., Inc., Herman H.....62
Gallard Advg. Agency, Inc.

Uptegraff Mfg. Co., R. E.....15, 16, 17, 18
Downing Industrial Advg., Inc.

Wagner Electric Corp.....20, 21
Arthur R. Mogge, Inc.

Westinghouse Electric Corp., E. Pittsburgh....12, 13, 28, 29, 37
Ketchum, MacLeod & Grove, Inc.